

Field Development Plans

A Handbook for Government Officials

Naadira Ogeer



The Commonwealth

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Introduction

This handbook has been developed to support government officials in Commonwealth member countries in the effective review, approval, and oversight of Field Development Plans (FDPs). The objectives of this handbook are:

- 1 To improve government officials' understanding of Field Development Plans
- 2 To provide an overview of the critical role government plays in the FDP process and why effective review and oversight is important
- 3 To provide practical tools to support government officials

The expected outcome from utilisation of this toolkit is early and ongoing engagement between companies and the government that is focussed on identifying and managing risks to optimise value for both the country and companies.

Glossary

Associated gas	Natural gas found in contact with, or dissolved within, crude oil in the reservoir. It can be further categorized as gas-cap gas or solution gas.
Commercial discovery	A discovery that is deemed possible to develop, as it is technically and economically viable.
Commissioning	Safe and orderly handover from the construction firm to the oil and gas company to ensure operating performance and reliability of the facility. It is a process of testing and assuring all systems and components function as per design parameters.
Decommissioning	Removal, disposal or otherwise dealing with wells, structures, facilities, installations and materials used in petroleum operations in connection with the abandonment or cessation of petroleum operations. This includes site restoration to clean up, make safe and protect the environment.
Discovery	Existence of hydrocarbons (petroleum, oil and gas) that was previously unknown.
Field	An area consisting of a single reservoir or multiple reservoirs all grouped on, or related to, the same individual geological structural feature and/or stratigraphic condition. <i>Please note: could be defined differently by regulatory authorities.</i>
Field Development Plan	A plan for developing a petroleum field. Also referred to as a Plan of Development.
Operator	The company responsible for managing an exploration, development, or production operation.
Pigging	Practice of using devices generally referred to as “pigs” or “scrapers” to clean and inspect pipelines.
Reserves	That part of resources which are commercially recoverable and have been justified for development. Proved reserves have a “reasonable certainty” of being recovered. “Probable”

or “possible” reserves are lower categories of reserves, commonly combined and referred to as “unproved reserves”, with decreasing levels of technical certainty. The term 1P is used to denote proved reserves, 2P is the sum of proved and probable reserves and 3P the sum of proved, probable and possible reserves.

Reservoir	A subsurface rock formation containing one or more individual and separate natural accumulations of moveable petroleum that is confined by impermeable rock and is characterized by a single-pressure system.
Resources	The total estimated quantities of petroleum contained in the subsurface, also referred to as petroleum-initially-in-place. Subcategories are reserves, contingent and prospective resources. Contingent and prospective resources are less certain because some significant commercial or technical hurdle must be overcome prior to there being confidence in the eventual production of the volumes.

Background and Need for the FDP Handbook

The Commonwealth Secretariat, through the Oceans and Natural Resources Division, supports member countries in the sustainable development of their natural resources. The support provided by the Secretariat helps member countries optimise the socio-economic benefits and effectively manage the associated risks from the development of natural resources. Direct technical assistance is provided in policy formulation, fiscal, legal, revenue management and regulatory frameworks as well as capacity building for government officials. In addition, the Secretariat works in collaboration with other organisations to deliver on its mandate. The New Producers Group (NPG or Group) is one such partnership.

The NPG was established in 2012 by Chatham House, the Natural Resources Governance Institute, and the Commonwealth Secretariat. The NPG's aim is to achieve lasting and inclusive development outcomes in emerging producer countries and to help them prepare for a world beyond oil and gas. It is a network and community of practice bringing together over 30 countries which are new to the oil and gas sector, half of which are Commonwealth countries (CWC). NPG activities are centred around holding Discussion Meetings¹, including the Annual Meeting, National Seminars, publications which are focused on issues pertinent to emerging producers, and capacity-building initiatives (e.g. training, mentoring, technical teleconferences, workshops and webinars).

At the 2019 NPG Annual Meeting, government officials identified Field Development Plans (FDP) as an area where support was needed. In response, the NPG conducted a seven-day training workshop during October 2020 on "Government Review and Approval of Field Development Plans" which was attended by almost 100 officials from 11 countries. In 2021, the Group has facilitated several countries to develop internal government processes which enable the effective review of FDPs.

Additionally, as part of the Commonwealth Secretariat's direct technical assistance to member countries, the review of Field Development Plans is often an area that requires strengthening.

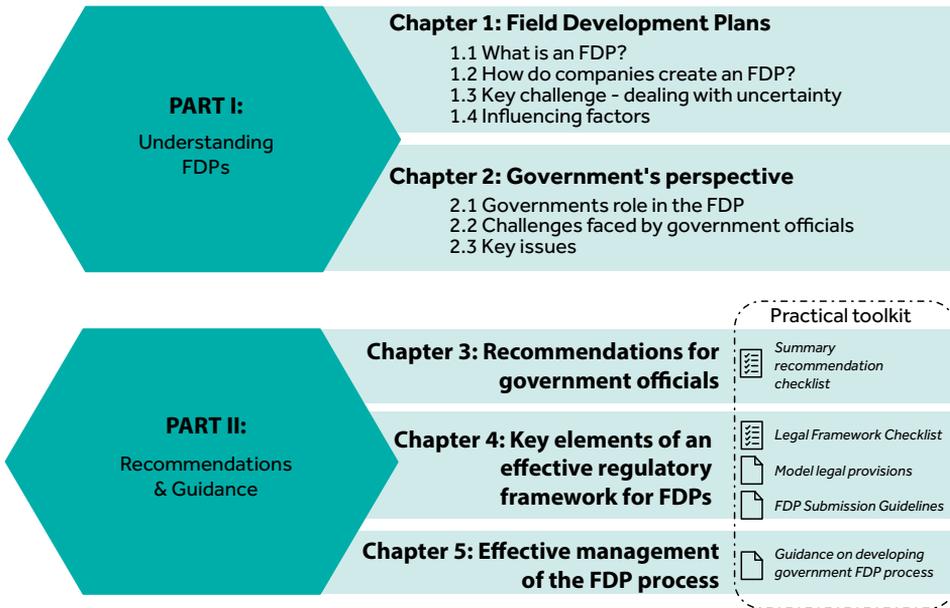
This handbook has been prepared by the Commonwealth Secretariat to address key challenges faced by regulatory bodies in member countries in reviewing, approving (and monitoring the implementation of) FDPs.

Note

1 Bringing together emerging producer countries with industry experts and producer countries to provide a forum for trusted, frank and non-attributable exchange on issues of mutual interest

How to Navigate and Use the Handbook

The FDP handbook consists of five chapters, arranged in two parts as shown below.



Part I: Understanding Field Development Plans. This provides context and background information from the perspective of the company ([Chapter 1](#)) and the Government ([Chapter 2](#)). It includes what an FDP is, how it is created, the role of government, challenges encountered and key issues that require government's attention.

Part II: Recommendations and guidance for government officials. This provides recommendations for the efficient and effective approval and regulation of FDPs. This includes:

- 10 summary recommendations for government officials ([Chapter 3](#))
- Guidance on effective regulatory framework for FDPs ([Chapter 4](#))
- Guidance on developing internal FDP government processes ([Chapter 5](#))

The following practical tools are included in the handbook as appendices for ease of reference:

1. Recommendation Checklist. A summary of recommendations for the efficient and effective approval, and regulation, of FDPs
2. FDP Legal Framework Checklist. A supporting template is included in the toolkit to aid in assessing the robustness of the existing national legal requirements governing FDPs. Depending on the circumstances and the needs, the checklist can serve different purposes. These may include identifying areas for improvements, supporting broader legal reform and improving governance.
3. Model Legal Provisions. The provisions can be used as a reference guide for ensuring the key aspects related to FDPs are adequately addressed in the legal framework. This includes the FDP approval process, FDP requirements and associated regulatory oversight.
4. Model Template for National FDP Submission Guidelines which countries can adapt for their national context. To complement legal requirements, many countries provide a supplementary technical document to provide guidance to companies on the contents of FDPs that are to be submitted for government review. A template is provided which includes suggested section headings and a brief overview of the technical requirements which can be tailored to individual country circumstances.
5. Guidelines on developing an internal government FDP Process. Outlines a structured step-by-step process that governments can use to develop internal FDP reviews.

If you are new to the concept of FDPs, it may be useful to read through the handbook fully and, in particular, [Chapter 1](#) to gain an understanding of the context and significance of FDPs.

If you are familiar with and have experience with FDPs, you may wish to refer to specific sections of the handbook relating to areas of interest or proceed directly to the tools/templates provided.

Part I

Understanding Field Development Plans

Chapter 1

Field Development Plans

1.1 What is a field development plan?

During the exploration phase, companies drill exploration wells to determine whether the petroleum reservoirs exist. If a discovery is made (i.e. the well encounters a petroleum accumulation or “reservoir”), the company enters an appraisal phase to better understand the size of the field (grouping of multiple reservoirs), subsurface risks and to determine if it can be technically and commercially developed. If the company determines that it is a “commercial discovery”, the next step is to decide how the field will be developed.

A Field Development Plan (FDP), outlines how a company intends to develop a petroleum field, manage the impact on the environment and society, as well as forecasts for production and costs. This involves complex issues such as how to manage the reservoir, how to bring the petroleum to surface (wells), process (facilities), transport to markets (e.g. pipelines, tankers, storage) and sell the various products. It is the outcome of a complex and long process of evaluating multiple development concepts for a field and selecting the best option that successfully manages risks and delivers the greatest value to its shareholders.

Why is it important?

Developing a petroleum field requires the safe and efficient execution of complex, technical, multi-billion¹-dollar projects. The FDP is the blueprint for how this will be done and is therefore critical for both the company and the country to maximise value and minimise risks from an oil and gas project. In most countries it is unlawful to develop petroleum without the government’s approval of an FDP.

A company will not ramp up activities on a project until it has received government approval of its proposed plans given the significant risks and investment. In many instances, the ability to secure financing will be conditional upon receiving such approval.

From the country’s perspective, an FDP will have significant implications for the economy (e.g. government revenues and local content) the environment and communities. In most countries, petroleum resources are vested in the State on behalf of its citizens. For a developing country, an FDP which produces a

¹ The average cost US\$6 – 11 billion “Spotlight on Oil and Gas Megaprojects” Ernst and Young report

successfully executed project has the potential to significantly increase GDP and increase government revenues.

A well-designed FDP is a necessary but not sufficient condition for the oil and gas project to contribute to economic development while minimising social disruption and environmental harm.

A Government's regulatory role is to ensure the company's proposed plan aligns with the governmental strategies for the sector and the selected development concept ensures the safe, sustainable, optimal development of the country's finite resources. However, the view on what is "*optimal*" may not necessarily be the same between the company and the government. It is therefore imperative that the regulator ensures the country's interests are adequately incorporated into how the resources will be developed. Once approved, all future activities on the field should be consistent with the FDP.

The FDP is therefore one of the most important approvals in an oil and gas project.

1.2 How do companies create a field development plan?

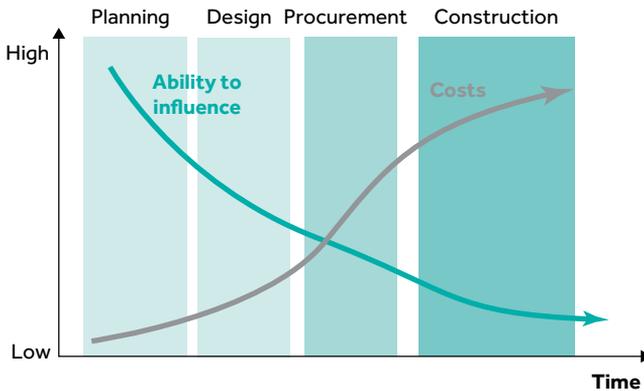
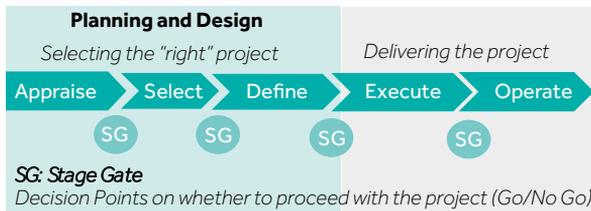
Bringing petroleum discoveries to production requires the safe and efficient execution of extremely complex, technical multi-billion²-dollar projects. These projects have significant risks and, if poorly executed, can result in environmental disasters, severe financial repercussions and reputational difficulties for the companies involved.

As such, oil and gas companies have developed processes to manage risks and maximise returns from projects. The FDP is a critical part of this process.

The company processes are based on the principle that good planning is fundamental for the success of a project. It is well known that the ability to affect outcomes without significantly impacting costs is highest at the start of the project and decreases as the project moves towards completion. Costs and staffing levels are relatively low at the beginning of a project and will ramp up significantly once design decisions are made as materials and expertise etc. need to be procured for actual construction. Without effective planning, rectifying errors or making changes later is costly, difficult and may jeopardise the project's goals.

This is often referred to as the cost-influence curve (shown in [Figure 1.1](#)) and illustrates that opportunities for value optimisation are greatest in the planning and design phases of a project.

2 The average cost US\$6 – 11 billion "Spotlight on Oil and Gas Megaprojects" Ernst and Young report

Figure 1.1 Project Cost/Influence Curve**Figure 1.2 Stage Gate Process**

Oil and gas companies apply this concept to the progression of a discovery to production by using a phased or “stage gate” (SG) process. The terminology used for this project management system varies among companies, but typically consists of the Appraise, Select, Define, Execute and Operate phases. At the end of each phase, senior management reviews project progress (via standardised reports, metrics etc.) and makes a decision on whether the project can proceed to the next phase or if it should be dropped, delayed or requires further work. During the planning and design stage, the focus is on “selecting the right project” and thereafter it is around implementation, as illustrated in [Figure 1.2](#).

This structured approach ensures that senior management has sufficient oversight and control on the project before committing further company resources to the project. The typical activities in each phase are as follows:

- *Appraise*: Post-discovery, an appraisal programme is developed to assess the size of the discovery which will carefully balance the need and cost of additional information with the additional benefit it brings. Efforts are focussed on data collection (e.g. seismic surveys/drilling additional wells) and analysis to assess the amount of oil and gas (volumes of hydrocarbons in place) and crucially how much can be recovered. Data is also collated on its characteristics, drilling hazards and potential production levels (reservoir and well performance uncertainties may influence this). This culminates in a decision as to whether it is technically and economically viable to develop the field – i.e. if it is a “commercial discovery”.

- Select*: Different options to develop the field are created, evaluated and a preferred concept is selected. This involves complex issues such as how to manage the reservoir, the design and management of various aspects required to bring the hydrocarbons to surface (e.g. wells/facilities), transportation to markets (e.g. pipelines, tankers, storage and export systems), financing and sales arrangements. Determining the optimal plan that minimises the risks and maximises value is an iterative process that requires multi-disciplinary collaboration to ensure an integrated approach to developing the field. (as illustrated in [Figure 1.3](#)). This involves specialists such as geologists, geophysicists, engineers (petroleum, reservoir, drilling, completion, facilities) HSE and commercial teams.
- Define*: The selected development concept is optimised, and a detailed project plan is developed. Costs begin to ramp up as the project team is expanded and long-lead items are procured. Technical specifications (Front End Engineering and Design (“FEED”), cost estimates, contracting strategies, risk management (identification and mitigation) and the project schedule are developed to an appropriate level of detail to freeze the scope of the project. The detailed engineering and benchmarking will result in a more comprehensive understanding of the project and forecasts of production and costs etc. At the stage-gate review, if senior management is confident the project has met all the necessary technical assurance requirements, that it is value accretive and controls are in place to deliver the project on time and budget, it will be “sanctioned” and progress to the next phase. This is referred to as the Final

Figure 1.3 Integrated Field Planning – Multi-disciplinary Iterative Process



Investment Decision (FID) and is the company's commitment to invest money (often billions of dollars), people (project teams will include several technical disciplines) and other resources into the project. FID will therefore also depend on the company's ability to fund the project, as well as how the project ranks among other investment options.

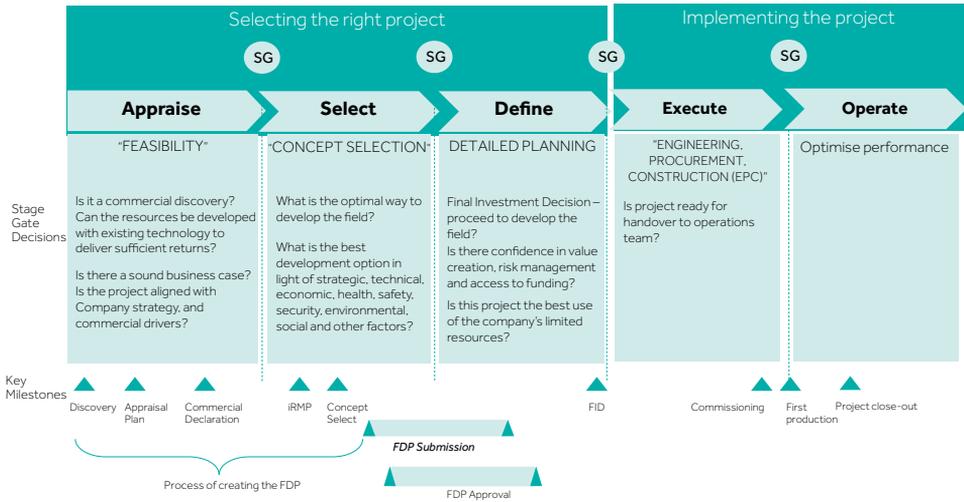
- *Execute*: Activities are executed per the project plan with the oil and gas company in the role of 'project managers' as the work is carried out primarily through specialist firms. Most of the project expenditure is incurred as EPC (Engineering, Procurement and Construction) contracts are signed, wells are drilled and facilities are built, installed and commissioned. Ability to meet project cost and schedule will depend heavily on the quality of pre-sanction preparation.
- *Operate*: Production begins, revenues are generated and the asset is managed to maximise returns. The economic life of a field can extend to 20–40 years and production methods used will depend on the reservoir characteristics and the age of the field. Initially, petroleum is brought to the surface from the natural pressure of the reservoir combined with artificial lift techniques such as pumps (primary recovery). When the pressures fall as the field matures, injecting water or gas to displace and drive the hydrocarbons into the well can increase production levels (secondary recovery). There are also tertiary recovery methods which can extend a field's productive life such as introducing heat, gas (e.g. natural gas, nitrogen, carbon dioxide) and chemicals. Given the long lifespan of the asset, it will require significant maintenance over its useful life (e.g. wells – workovers, pipelines – pigging, facilities - turnarounds). When it is no longer economical to produce the field, it will have to be decommissioned (i.e. wells plugged and abandoned, facilities removed, the site restored and monitored). Planning for decommissioning is an integral part of the overall field development process and should be considered during the design phase.

The FDP submission to the government is the outcome of the integrated field planning that occurs during the appraise, select and define phases. It is the documentation of the company's decisions, the rationale and initial forecasts for an oil and gas project including its impact on the environment and society. It is the critical mechanism that ensures there is shared understanding between the company and government on how petroleum resources from a particular discovery will be produced, monetised, risk managed and its inherent value shared.

Depending on the nature of a project, the company's project management process, its risk appetite as well as regulatory requirements, an FDP could be submitted during either the Select or the Define phase. It is often the case that companies will seek governmental approval of the FDP prior to any significant increase in costs during the Define phase.

A summary of the stage-gate process, the key decisions and the linkage with the FDP is illustrated in [Figure 1.4](#) below.

Figure 1.4 The stage-gate process and the FDP



iRMP, initial Reservoir Management Plan; FID, Final Investment Decision

1.3 The challenge of developing FDPs – decision-making under uncertainty

The FDP should consider the entire life cycle of a field up to and including decommissioning. However, it is often developed across the Appraise and Select phases when there is limited information and a wide range of uncertainty on several critical variables. A robust FDP will consider these risks and uncertainty and include them in the evaluation of various development options.

The subsurface is at the heart of a petroleum project and is the largest areas of uncertainty. Oil and gas are produced from underground reservoirs in depths ranging from 5,000 to over 25,000 feet depending on the location. There is no visibility of the subsurface conditions and it can only be estimated by experts using various technologies – data gathering, evaluation and modelling. It is complex and the ability to make effective predictions will depend on reliability and relevance of information gathered during the Exploration and Appraisal phase.

All other disciplines work with the subsurface assumptions as a critical input. Reservoir conditions such as fluid characteristics, impurities, drive mechanism, and others subsurface factors (e.g. pressure, temperature and shallow hazards) will impact the drilling programme (e.g. type of drilling fluids, number and placement of wells, completion design, safety measures). This in turn will have implications for the design of the facilities and infrastructure (e.g. type of processing/pipeline size). These factors are interdependent and require significant co-ordination to understand how choices made in one area effects the others. The various subsurface and surface disciplines will employ appropriate techniques to establish the risks and determine options for developing a field

safely. Part of the company's stage-gate approach to decision making will include technical assurance of these decisions. This often includes a review by subject matter experts who are not involved in the project to provide independent assessments, referred to as "peer reviews".

Ultimately, a company will only proceed with a project that is both technically and commercially viable – i.e. can it be developed safely, with available technology? Can it generate sufficient economic returns?

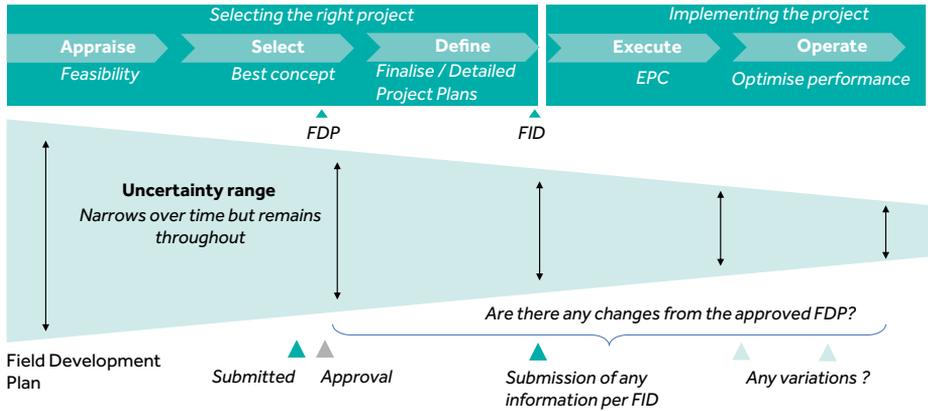
Economics therefore plays a central role in generating and selecting the development option. A project's economic return is dependent on both technical and commercial factors, and there is a large degree of uncertainty across both.

The economics will depend on the amount and timing of the net cash flow from the asset over its useful life. This can extend over 40 years. The net cash flow is the amount of cash that a company expects to receive after deducting costs, taxes and other cash outflows from revenues. Revenues are determined by price (very uncertain and extremely volatile) and production of oil, gas and related products (e.g. natural gas liquids). Deductions would include the cost to develop (capital expenditure, "capex"), operate (operating expenditure, "opex") and decommission ("decom"), as well as payments to the government. In some countries where the fiscal regime is ambiguous, or silent on certain elements, assumptions will have to be made. The project economics therefore encapsulate a project's risk, as it depends on technical, commercial and regulatory factors.

When the FDP is being developed (Appraise/Select), uncertainty is at its highest as there is limited information. Estimates of the project's costs, production and revenue will depend heavily on benchmarking and the judgement of experts (e.g. interpretation of modelling). The FDP's purpose is to document the preferred development concept in light of those uncertainties and the assumptions made. The use of scenarios, and stress testing the project to downside cases is common practice. This helps to understand project returns under a range of outcomes with key variables taken into account.

Uncertainty remains throughout the life of the asset, but as further information is collected and additional technical work is completed (Define, Execute, Operate) the range of uncertainty is smaller.

A well-constructed FDP will consider the uncertainty range but it should not be treated as a static or inflexible document. It may be necessary to update and modify the FDP as circumstances change over the project lifecycle (see [Figure 1.5](#)). For example, if the FDP is submitted at the end of the Select Phase, detailed engineering and studies would not yet have been completed. It is possible that during the Define phase, as a consequence of new information and analysis, the FDP may require changes. This may also occur during the Operate phase where, for example, reservoir performance is not as expected (there may be higher or lower rates or different fluid properties) which may require changes to drilling plans or existing processing facilities. Material changes should be reflected in the approved FDP.

Figure 1.5 Uncertainty and the FDP

1.4 What factors influence the FDP?

An oil and gas company will consider several factors when determining the optimal solution for producing oil and gas from a commercial discovery. This involves complex issues such as how to manage the reservoir, the design and management of other aspects required to bring the hydrocarbons to surface (wells/facilities), transportation to markets (e.g. pipelines, tankers, storage and export systems) and sales arrangements. The process of developing the FDP will consider issues such as:

- Safety and environmental considerations
- Alignment with the company's strategy and commercial drivers
- Location: whether the discovery is onshore or offshore and site specifics (e.g. water depth), proximity to infrastructure and other fields, distance to markets, susceptibility to disruptions (e.g. natural disasters).
- Technical factors such as
 - Geology: the reservoir is at the heart of the FDP and influences many other critical design components. Characteristics such as the hydrocarbon type (oil/gas, Gas Oil Ratio "GoR"), the volumes in place (how much oil and gas is underground), recovery factor (how much can be produced from the reservoir), quality (heavy/light, impurities), number and compartmentalisation of reservoirs (stacked or fragmented), pressure and temperature will influence the drilling and completions programme, surface equipment, facility type, processing requirements, export systems capacity and sales arrangements.
 - Available technology and engineering considerations. This will impact various aspects such as drilling, completions, facilities and export systems.

- Operability: track record and reliability of various options as well as understanding of the future operations and maintenance requirements
- Impact on communities
- Time to production: earlier production is generally favourable as in most instances would enhance project economics.
- Flexibility if risks materialise especially adaptability to reservoir and well uncertainty.
- Costs and ability of operator to fund the development: The timing and amounts of capital expenditures (capex) and operating costs (opex) can impact project economics. Depending on the cash flow position and balance sheet strength of the operator access to finance and financing costs may also influence the preferred development option.
- Availability of specialist equipment – for example deepwater drilling rigs, construction yards
- Alignment amongst partners. There are often several owners in an oil and gas project which is usually structured as a Joint Venture (JV). The strategic and commercial drivers may vary amongst owners and the technical perspectives may also be different. The operator will in the first instance need to ensure that there is JV alignment and support for the FDP prior to submission to the Government. In several countries the National Oil Company is often a JV partner.
- National policies and regulatory requirements. The FDP will be subject to a nation's policy and legal framework. These instruments should incorporate the country's strategy for development of the sector and associated conditions and obligations which can influence the FDP e.g. domestic utilisation of oil or gas, contract/license duration, when the FDP needs to be submitted, its contents etc.
- Risk assessment. Risks and uncertainty are at their highest post discovery and, although they narrow over time, they remain a mainstay of any oil and gas field. The nature of risks impacts all aspects of the project and would need to be addressed in the FDP. This includes matters such as technical, HSSE (Health, Safety, Security, Environment), social, legal, commercial and project execution.
- Maximising value. There are various economic indicators that companies consider such as Net Present Value, Internal Rate of Return, Payback Period and Capital Efficiency. The company will consider which concept yields the highest economic returns.

The areas above are not mutually exclusive and require an integrated approach to developing a field. The strategic, technical, economic, social and environmental issues need to be assessed in order to determine the optimal concept.

Figure 1.6 summarises the key factors that will influence the company's choice of how to develop the field.

Ultimately, given the stage-gate approach, for the project to proceed into the Define phase, it will have to meet three key thresholds:

- Can the project be executed safely with existing technology?
- Are the risks well understood and considered in the project plan?
- Are the returns sufficient given the risks and other alternative opportunities?

Figure 1.6 Factors influencing the FDP (optimal development concept)



Chapter 2

Government's Role In the FDP Process

The FDP is submitted to the government for approval and is therefore a critical moment in the project lifecycle where decisions will affect the field value and associated benefits to the country for 20 years or more. For a developing country, a single FDP can easily be equal to, or double the size of, the entire economy because of the scale of investments and potential government revenues. It is therefore of paramount importance that the government is able to review these plans to ensure that the economic, social and environmental issues are effectively addressed.

2.1 What Is the government's role in the FDP process?

The ownership of petroleum resources is vested in the State on behalf of its citizens. The Government clearly has a responsibility to ensure that the country's finite resources are sustainably developed and effectively managed to provide maximum benefits to its people. This duty is discharged through:

1. *Clear strategies, policies and laws.* A robust regulatory framework (strategy, policies, legal framework) should be developed which is consistent with national goals and international best practice. This provides clear direction to investors and the public on the government's expectations for the sector and the "rules" under which activities will be undertaken.
2. *Effective regulatory oversight.* A "regulatory" function to ensure compliance with strategies, policies, laws and international best practice. This would cover the full spectrum of specific petroleum activities but also environment, health and safety, social and fiscal matters.
3. *Effective management of the state's commercial interests.* Where the government's strategy is to have state participation (either via NOC or other arrangements) it will require effective management.
4. *Effective revenue management.* It is important to ensure that the government receives its fair share of revenues and prudent macroeconomic planning is adopted. Avoiding unrealistic expectations and destabilising effects on the national economy requires effective revenue forecasting, collection, allocation (e.g. federal/local) and auditing functions.

Since an FDP is the plan of how a company intends to develop petroleum resources belonging to the country, it is to be expected that the government has an instrumental role in the FDP process. It should therefore be fully informed of all matters relating to how the country's petroleum will be monetised. In most countries it is legally mandated that development activities cannot commence without an approved FDP. The government's role in the various aspects of the FDP process is summarised [Table 2.1](#).

Table 2.1 Government's role in the FDP process

Government role	Application to the FDP
Strategy/Policy and Laws	<p>The government should ensure that...</p> <ul style="list-style-type: none"> - It communicates its long-term vision for the sector to the company, especially where these have not yet formally been adopted. This is of particular importance in frontier countries where formal policies may not yet be in place. - A robust legal framework governs FDPs i.e. clear requirements in laws, regulations and contracts. - It identifies and agrees treatment of ambiguous areas in the legal framework with the operator to avoid potential future disputes.
Regulator	<p>Please refer to: Section 4.1 for further details on the Policy Framework Section 4.2 for further details on the Legal Framework</p> <p>In its regulatory capacity the government would grant approval of the FDP and should ensure that:</p> <ul style="list-style-type: none"> - The company's proposed plan supports the government's strategies for the sector. - The proposed plan is in accordance with national laws, the petroleum contract and international best practice. - The selected development concept ensures the <i>safe, sustainable</i> and <i>optimal</i> development of the country's finite resources. This involves ensuring technical, economic, social and environmental issues and risks are effectively addressed. - The uncertainties and risks are adequately addressed in the FDP. The FDP should also ensure that appropriate contingency measures are in place if risks materialise. - The selected development concept provides maximum benefit to the country. - There is coordination among various government agencies for effective and efficient review of the FDP (see Chapter 5). - All future activities, work programmes and budgets for the field are consistent with the approved FDP. - Effective records are maintained for the field.
Commercial entity	<p>Where the state has an interest in the field (e.g. NOC is a JV partner) the entity should ensure that its commercial interests are protected. For example:</p> <ul style="list-style-type: none"> - Conduct and review technical assessments of the FDP. - Ensure effective engagement through the management committee. - Ensure oversight of procurement process costs, intra-company transactions and the implications for the project. - Be conversant with the contractual terms and conditions e.g. regarding sole risk operations, back-in rights.

(Continued)

Table 2.1 (Continued)

Government	Application to the FDP
Revenue management	<ul style="list-style-type: none"> <li data-bbox="359 242 1059 460">– The amount, timing and risks to government revenues from the project should be understood. As part of the approval process the government should undertake economic analysis of different development options to understand which represent maximum revenue generation. This will not be the only criteria considered but should be clearly understood. <li data-bbox="359 465 1059 587">– Ambiguous areas in the fiscal regime should be addressed as can result in value leakage and government revenues not materialising as expected (with serious implications for the national economy). <li data-bbox="359 593 1059 780">– Given scale of revenues and its impact on the national economy, multi-year estimates should be incorporated into institutions responsible for macro-economic planning (e.g. Ministry of Finance, Planning). These should be revised on an ongoing basis, especially if there are subsequent changes to the FDP. <li data-bbox="359 786 1059 875">– Ongoing understanding of (total) revenues from the project. Any significant deviation from future revenues (upside and downside) should be understood. <li data-bbox="359 880 1059 970">– Any variation to an FDP should be supported by an economic assessment on the implications to government revenues.

The specific government agency that performs the roles in [Table 2.1](#) will vary depending on the institutional arrangement and capacity. For example, in some countries the ministry responsible for petroleum performs the first three functions and the Ministry of Finance performs the fourth. In others, the NOC is the lead agency and often performs several functions. Yet still, in other countries, there is often separation of the four functions amongst the sector ministry, an independent regulator, the NOC and the Ministry of Finance. Regardless of who performs the roles they are all required for effective administration of the sector.

Given the importance of the FDP, the government should put measures in place to minimise the risk of regulatory capture. This refers to a situation where the positions taken, and decisions made by regulatory authorities, are unduly influenced by the industries or interests they are charged with regulating. The result is that an agency, charged with acting in the public interest, instead acts in ways that benefit incumbent firms in the industry it is supposed to be regulating. This could be due to several factors including corruption, lack of information or expertise and the inability of government institutions to carry out tasks effectively (e.g. due to insufficient resources such as funds or staff).

2.2 Challenges faced by government officials

As seen in the above table there is a significant role for government in the Field Development Planning process. Government officials in developing countries who are involved in the review of the FDP face several challenges, such as:

- Lack of technical expertise. The FDP encompasses a multitude of specialist areas (e.g. geology, petroleum engineering, environmental, economics) and the government may not have the requisite expertise in-house to review.
- Lack of economic analysis. Often the focus of reviewing an FDP is on the subsurface and engineering aspects and there is a poor understanding of how the country will benefit from the project and the risks to government revenues. The upstream petroleum fiscal regime is very complex and requires sophisticated economic models to understand the overall value from a development and how it is shared between the company and government. In many instances the government does not have economic models in place, nor sufficient expertise to perform economic analysis.
- Involved too late in the process. The government's engagement with the FDP is often when it is submitted for approval. At that point, the government has limited influence on the FDP as critical decisions would have been made 6-18 months earlier in the Appraise and Select phases. If there are areas of misalignment with the company it can result in delays or the FDP not being approved.
- Lack of funding and/or time to procure specialists to review the FDP or conduct independent analysis. This may be as a consequence of late involvement in the formulation of the FDP, poor planning or unrealistic approval timeframes.
- Lack of data. This may be due to absence of clear guidelines to the company on what is required, a compliance issue or poor information-sharing among government agencies.
- Extremely short timeframes to perform its regulatory function. In several countries, the legal framework results in considerably compressed timelines (e.g. 60 days) within which the government needs to indicate to the company if its FDP is approved. Given the complexity and technical nature of the FDP this introduces significant risks to the country as the government is not able to perform a robust review of the FDP. In some jurisdictions, if specific issues are not raised, the FDP is deemed approved.
- Lack of co-ordination among government agencies. Where there are multiple agencies involved there are often differing objectives, duplication of efforts, lack of information sharing and insufficient communication which could undermine a whole government approach to the FDP. Furthermore, this increases the administrative burden for companies resulting in an inefficient process, which leads to delays and erosion of value.

- Political interference and pressures. Given the potential revenues and expectations on the positive impact that activities will have on local communities, there is often significant pressure on officials overseeing the sector for approvals so activities can begin. This is often exacerbated during election cycles. In countries with weak regulatory frameworks, technocrats often face the challenge of decisions being made without their input or recommendations being overturned.

2.3 Key issues requiring government attention

Given the challenges described above, government officials should pay particular attention to the following factors when reviewing an FDP:

1) Companies and governments have different drivers – the view on what is “optimal” may not necessarily be the same.

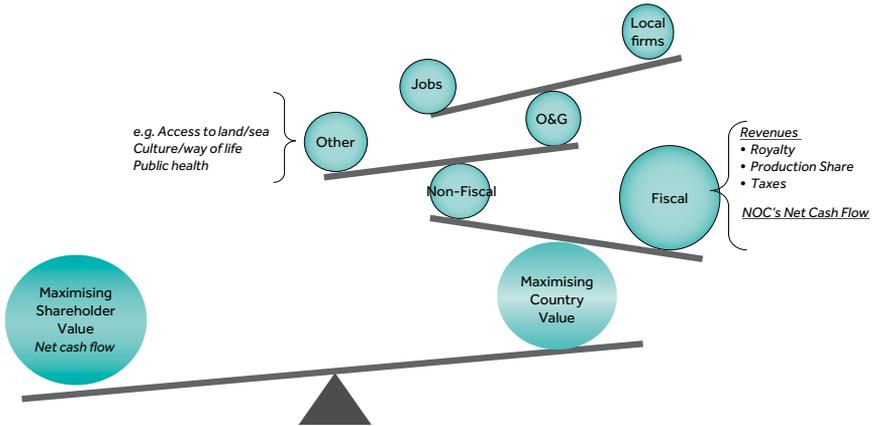
Oil and gas companies are profit-seeking entities whose prime objective is to maximise value to their shareholders. This maxim provides a unifying driver within a company. Internal processes are designed to ensure the deployment of its limited financial and human resources produces the greatest return. In the context of the FDP, the “optimal” development concept is the one that maximises net cash flows to the company. At every “stage-gate”, the project must demonstrate business value for it to progress.

Governments on the other hand, are faced with the complex task of maximising value to the country from a combination of the net direct and indirect benefits. The direct benefits would be subject to uncertainty but can be quantified by estimating the timing of government’s various revenue streams (which will be dependent on factors such as the fiscal regime, and ultimate recovery of petroleum). The basis for this analysis would be the same as a company undertakes – i.e. understanding net cash flows. The indirect benefits (e.g. local content), which are front and centre in national discourse are, however, difficult to quantify. The potential negative impacts on other sectors (e.g. fisheries, tourism), communities and public health must also be factored in, but these are not easily measurable. Understanding the value from a project is clearly a much more complex undertaking from a country’s perspective. This is illustrated in [Figure 2.1](#).

The differing objectives between a company and government exists in all sectors. The high value non-renewable nature of petroleum requires particular attention from government officials to identify areas where the company’s efforts to maximise net cash flow are sub-optimal from the country’s perspective.

Whilst each situation needs to be assessed on its own merits given the company and country context, some examples where misalignments can occur are:

- Pace of development. A company is likely to pursue the development concept with the earliest first production. Fast-track developments are a special case where the acceleration of appraisal activities and the

Figure 2.1 Balancing company and country interests

simultaneous execution of detailed engineering introduces additional risks to a project. This presents additional challenges to the government where capacity is limited. On the other hand, it is also possible that a company may prefer a slower pace of development given competing projects in its global portfolio and its resourcing constraints. This may be at odds with a country's pressing need for revenues and benefits from the project.

- Depletion strategy. The company is likely to pursue a depletion strategy that maximises production rates. This could ultimately result in lower recovery from reservoirs which would be incongruent with many countries' stated objective of "maximising economic recovery of petroleum".
- Treatment of associated gas. For example, a company may opt to flare associated gas rather than spend additional money to re-inject or build infrastructure to monetise.
- Local content. A company focused on cost and schedule is unlikely to proactively identify or prioritise areas for local firms to participate in the project (as usually perceived as introducing additional risks and costs).
- Standardisation and procurement strategies. A company managing a portfolio of projects is likely to adopt standardised designs to leverage economies of scale. The expected benefits being lower costs and efficiency. These strategies may however limit the opportunity for local players and could also impact ultimate recovery.
- Technology options. The use of innovative versus proven technology may yield significant additional benefits to a company given potential application across the portfolio of its projects. The potentially higher costs and additional risks for a "pilot" project may be sub-optimal from the government's perspective if there is limited future application within the country.

- Costs. Cash-constrained companies may favour solutions that minimise up-front spending.
- Optimising infrastructure based on project vs industry approach. The company would develop infrastructure and export systems with capacity to match a particular project or across a group of projects. The government, on the other hand, would aim to develop infrastructure more holistically, taking other operators into consideration to increase the likelihood that small and marginal fields can be developed. Thus, an industry approach should yield higher benefits to the country as shared infrastructure should result in lower development costs (avoiding capital spend for duplication of facilities and infrastructure) and ideally translate into higher profitability and government revenues.
- Unitised developments, A joint development of one or more fields across multiple blocks and operators could maximise recovery of petroleum and be socio-economically profitable. This, however, increases the complexity, uncertainty, time to production and costs.

The examples above do not necessarily translate to lost value to a country or apply across all countries. However, it is prudent that the government identifies potential areas of misalignment to safeguard the nation's interest. Ongoing engagement with the operator for timely resolution of issues to enable efficient approval of FDP should be beneficial to both parties. Ideally engagements should occur post discovery and leverage existing procedures to avoid inefficiencies and unnecessary administrative burden.

2) Lack of co-ordination amongst government agencies can be a source of value erosion

A petroleum project has touchpoints across multiple arms of government with each operating in accordance with its respective mandate. For example:

- Ministry of petroleum: maximize investment, regulate petroleum operations
- Ministry of finance: maximise government revenue
- Ministry of environment: minimise harm to environment, perform environment and social impact assessments
- Ministry of labour/Social and Community Development: maximise local content
- Ministry of planning: align sector goals with national development goals
- Ministry of public utilities/works and infrastructure/Transport: maximise spill-over effects for broader public benefits such as ports, roads, telecommunications.

Governments are faced with the complex challenge of balancing multiple objectives that span fiscal and non-fiscal elements (see [Figure 2.1](#)). In practice,

it is not possible to achieve all these objectives simultaneously. This is especially so if there is limited in-country capacity and experience in the petroleum sector. In addition, with responsibilities related to the FDP discharged across several agencies, there is likely to be different, or sometimes competing, objectives. For example, there is often a mismatch between ambitious plans for local content and the existing capacity of nationals and local firms to be able to feed into a country's first oil and gas development project. Without a shared view among government agencies on what the project can deliver given the specific country and industry situation, it can lead to conflicting communications with the operator. This could result in project delays. These may arise from the operator re-working project details or an FDP failing to adequately address certain issues when submitted.

Governments have the responsibility to ensure a coherent, comprehensive inter-departmental approach by reconciling any potentially conflicting internal objectives and being conscious of potential trade-offs.

Prioritisation will be required to optimise how the FDP can contribute towards national development goals and will require a coordinated effort among government entities.

This will require identification of specific, tangible areas the government would like to see addressed in the project development. Doing so will create a coherent government position in recognition of the constraints and forms the basis for engaging with the operator. It should be noted that recognition of constraints does not mean the government can't be ambitious regarding project expectations – but that it should be realistic.

Furthermore, given the government's relatively short window for reviewing the FDP, if the appropriate government agencies are not involved in a timely manner it can result in delays in approval or an inadequate assessment of the FDP.

Delays caused by misalignment of objectives, poor coordination and inefficiencies among government agencies can have knock-on impacts on first production. This erodes value for the country, and the company.

It is in the best interests of the country that agencies work together in the Appraisal phase (where ability to influence is highest) to identify areas of misalignment, understand trade-offs and develop an integrated government position. It would also enable each agency to plan for a timely review of the FDP, facilitate effective sharing of information and streamline the engagement with the operator (reducing the administrative burden and process inefficiencies).

Inter-agency coordination is therefore critical for a country to preserve and create value from its petroleum resources. It provides clarity to the company on the government's priorities and enables an efficient and effective review of the FDP.

3) The fiscal regime can impact the preferred development concept

The fiscal regime and treatment (or lack thereof) of well-known areas of value leakage can impact the company's preferred development concept. For example,

in a country where there is ring-fencing at the block or corporate level, a multi-phased approach to development (versus a full-field development) could result in lower government take. This may arise as the incremental capital spend from future developments defers government revenues.

As previously discussed, the FDP is influenced by a number of factors with economics being one, but not the only consideration. It therefore may not be the overriding motivation behind a phased approach – this can be very effective in de-risking technical factors and would be a prudent course of action for the operator. Nonetheless, in jurisdictions with such ring-fencing in place, it is important the government considers the company's area development strategy, versus only the singular project economics.

This is one example of how the fiscal regime can impact the preferred development concept. Therefore, the government needs to utilise expertise and tools to conduct an appropriate commercial evaluation of the FDP under various concepts. This would ensure a robust assessment of government revenues under various development options to avoid surprises.

Please note this is about understanding the vulnerabilities in the existing fiscal regime, not revisiting the terms of an existing petroleum agreement (contract sanctity) or the robustness of the country's fiscal framework.

4) The country, not the company, faces the majority of exposure to downside risks given an increasingly complex outlook for the sector

As governments approve new oil and gas projects there is a clear recognition that the global pandemic, and the growing momentum towards a lower carbon world, has led to increased uncertainty in the sector's outlook.

Projects that are comparatively high cost and of high carbon intensity would rank low on the global merit order. If conditions change (e.g. lower long-term pricing), those projects would likely be marginal in the future. Whilst a company can adjust to the situation, ultimately by selling such an asset, countries cannot. The risks from stranded assets are thus higher to the country. The government must therefore understand the relative positioning of its assets in the global cost and carbon intensity curves to ascertain its level of exposure. This should be part of the FDP review. In addition, it is in the best interest of the country that the carbon intensity of the various development options is considered, as are plans to ensure the lowest possible GHG footprint for the chosen concept.

Furthermore, government revenue stream from a project is typically weighted towards the later part of an asset's life. This fact, coupled with the changing risk landscape, may lead to a reassessment of how particular issues are treated. For example, the higher likelihood of an asset changing owners, increases the need to ensure that documentation around the FDP is robust. Another issue is decommissioning. In several countries, it is often not considered until well into its productive life – this approach increases the risk that the government may face extremely large, unfunded liabilities in the event of a stranded asset or company bankruptcy.

As part of the FDP review, government officials must carefully consider a project's robustness to a wide range of scenarios given the increasing uncertainty. The value of the project to the country should be stress tested to ensure it is robust to future disruptions.

5) The most significant challenge is often non-technical aspects of an FDP

The socio-political dynamics and pressing need for government revenues increases the complexities that government officials have to manage as part of approving an FDP.

There are often extremely high expectations about the size and timing of benefits the country will receive, especially on the issue of jobs and business opportunities. If the project cannot meet stakeholders' expectations, it can introduce confusion and complicate the approval process. These stakeholders include government institutions (finance, environment etc.), politicians (ruling elite and opposition), local communities, the public, NGOs and the media. In addition, the company may seek to expedite or circumvent the approval process through political interventions.

These aspects, unlike technical issues, are more difficult to manage and resolve. They require significant advanced preparation by the lead government agency in order to manage relationships, expectations and co-ordinate among various stakeholders.

Part II

Recommendations and Guidance for Governments

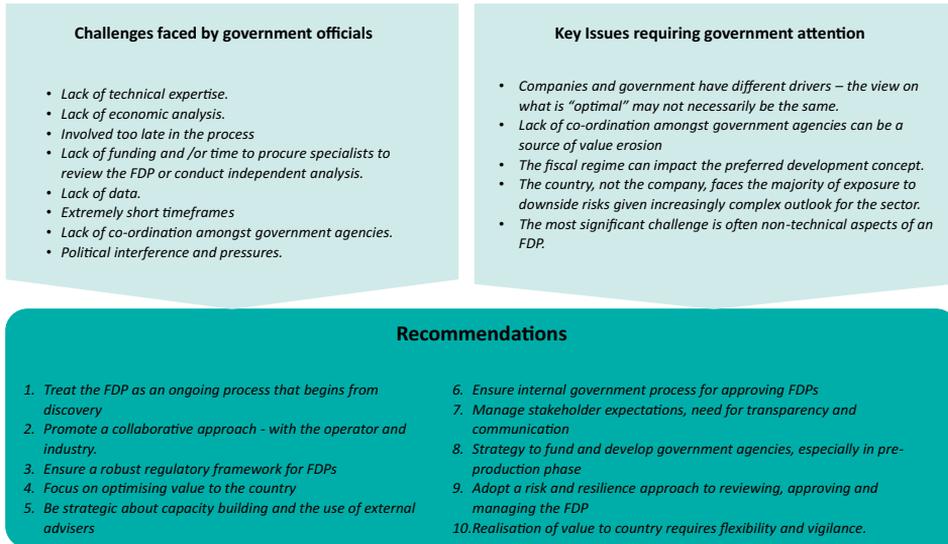
Chapter 3

Recommendations to Government Officials for Effective Review, Approval and Oversight of FDPs

This chapter is intended to provide guidance to government officials on the FDP process and stakeholder interactions to avoid regulatory capture, and ensure the country's best interests are served in the development of petroleum resources.

Adoption of the recommendations [Figure 3.1](#) should ensure all aspects of the project – strategic, technical, economic, social and environmental have been identified and that mutually agreeable solutions have been included in the FDP. They should also produce a collaborative and constructive environment (intra-government and government-operator) which should result in timely approval of the FDP and avoid delays for first production.

Figure 3.1 Key Challenges and Issues facing the Government and Recommendations



1. Treat the FDP as an ongoing process that begins from discovery

The government, as owner¹ and regulator of the nation's valuable and finite petroleum resources, should not be a passive participant in its development.

1 Petroleum resources are vested in the state on behalf of its citizens

The greatest ability to influence a project – and hence the opportunity for preserving or creating value for the country – occurs in the Appraise and Select phases. Early and ongoing engagement with the operator will help to safeguard the country’s interests. The government’s interaction with the FDP must be well in advance of the regulatory point of submission.

This requires a paradigm shift from a reactionary mode (waiting for the government to receive the FDP) to proactive engagement with the operator to ensure the country’s interests are best served.

2. Promote a collaborative approach – with the operator and industry

An oil and gas field’s life cycle spans decades. The FDP is therefore the starting point of a long-term relationship between the government and company.

It is inevitable that differences on elements of the FDP will arise as the government and company are not dealing with the same strategies, time horizon, constraints, objectives and pressures. Such differences will continue to present themselves after the FDP is approved. A positive constructive environment would be conducive to quick and timely resolution of issues over a project’s life span.

In the first instance, building a partnership based on a shared understanding of the project’s risks, opportunities and expected outcomes under various scenarios is important. This is fundamental to the development of the FDP and requires ongoing communication and information sharing by both the company and government.

The government should also promote collaboration among companies within the sector as it can yield substantial benefits. Industry collaboration, where appropriate, can re-orient efforts from an individual company’s focus on cost reduction towards value creation.

This was highlighted in reviews of the UK’s oil and gas sector. Following an independent review on how to maximise economic recovery from the UK Continental Shelf (UKCS), the government stated in 2015 that *“To effectively respond to the challenges posed to the UKCS, a significant shift in regulatory culture is needed, with a focus on catalysing, encouraging and facilitating collaborative partnerships throughout the sector”*². A 2020 review of the upstream supply chain indicated that *“companies are able to reduce costs, share knowledge and maximize the economic recovery from the basin”*³. There is thus growing evidence supporting the policy assertion that successful collaboration creates value for all – government, operators and suppliers.

2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/414444/Call_for_Evidence_Govt_Response-FINAL_120315.pdf

3 Collaboration becoming new reality as oil and gas industry index returns highest score of 7.1 | Deloitte UK

3. Ensure a robust regulatory framework

It is important for a country to have clear rules for FDPs given the far-reaching impacts on the economy, environment and society. These should be effectively addressed as part of the regulatory framework.

The regulatory framework refers to the combination of policies, laws, regulations, contractual arrangements and institutions that govern the petroleum sector, and by extension the FDP. This includes principles and commitments (obligatory and voluntary), at the national, regional and international level.

An effective regulatory framework will cover all aspects of the industry – operational, legal, fiscal, social, health, safety, environmental etc. Thus, it will sit across several sectors – for example petroleum, environmental, and finance. Effectiveness depends on the consistency and coherence between the regulatory frameworks across these sectors, as well as with broader economic development policies and related implementation tools.

The government's policy positions and international obligations should, as far as reasonably possible, be written in law. This provides clarity to companies and a basis for government agencies to plan ahead. It also allows for a non-discriminatory approach towards investors and avoids a situation where a contract (the petroleum agreement) serves as the primary legal instrument regulating the sector. This increases the complexity of administering the sector with each petroleum agreement, in effect having its own regulatory framework operating under separate rules. This is especially difficult for low-capacitated countries to manage and increases the probability of sub-optimal outcomes for the country.

The regulatory framework should minimize administrative burden and avoid inefficiencies. The use of standard definitions and reporting templates improves transparency, ease of administering and lends itself to effective monitoring and benchmarking of implementation across companies. The government can contribute to this by providing clear guidelines on timeframes and content of an FDP submission. Please see [Appendix A](#) for a Model Template for developing National FDP Submission Guidelines.

Each country's regulatory framework must be reflective of its own national context, objectives, laws, institutional framework and capacities. The formulation of national policy and legal framework must be carried out in a comprehensive manner which requires specialists to diagnose elements of the existing framework and make recommendations that reflect international best practice and are context appropriate.

Revising the regulatory framework is a complex matter that takes considerable time, but is essential for effective management of petroleum resources. It is the key tool to empower government officials facing challenges associated with the political economy and large asymmetries with operators.

Please see [Chapter 4](#) for an overview of an effective regulatory framework for FDPs and [Appendix C](#) for a checklist and [Appendix D](#) for model FDP provisions.

4. Focus on optimising value to the country

Government officials should be conversant with governing laws and contractual terms for the project and seek to optimise value to the country as decisions are made throughout the FDP process. Value from a project will be the combination of the net direct (government revenues) and indirect benefits associated with it. Optimisation recognises that trade-offs are an inherent part of decision-making where there are multiple objectives limited by time and resources.

The indirect benefits from the project will be dependent on country and project specific factors. However, there should be a shared understanding between the operator and the government on the potential benefits, especially on local content. In addition it is important to ensure that the negative aspects from a project will be effectively managed. It is therefore critical that effective environmental and social impact assessments are conducted with clear action plans in place to manage the risks.

The project economics should be one of the focus areas of government's FDP review as it provides the assessment of the direct benefits from an oil and gas project i.e. the revenue streams to government. Decisions made throughout the FDP process will impact the project economics and how value is shared between the investors and country. Performing economic simulations using different assumptions for key variables would provide a picture of the amount and timing of government revenues.

Scenario-based analysis is critical to understanding the direct benefits in light of the project risks and should inform the development concept for an oil and gas field. This would enable an understanding of the overall value from different development concepts and how it is shared between the company and government. In light of the growing downside risks to the country from the energy transition and stranded assets these should also be considered in assessing the project value and government revenues.

Ideally governments should have their own economic models and analysts to support the FDP review and approval process.

The economic analysis of FDPs should therefore be a core element of the government's approval process and should be given greater prominence and scrutiny.

5. Be strategic about capacity building and the use of external advisers

Policy and legislation can provide an effective framework for FDPs, but effective implementation requires that government institutions are adequately resourced to be able to execute their duties. The government should take a holistic approach to ensuring the right combination of people and tools are in place across the relevant

institutions. Attention should be placed on non-petroleum agencies, for example environment and finance.

Capacity building is a long-term endeavour and the country will need to consider the balance of immediate expertise required versus longer-term management of the sector.

Investment into human and technical capacity should be carried out as early as possible, but should be informed by a strategy that balances short-term needs with sustainable national development of talent. A skills-gap analysis would be a critical step to identify areas where the government may need expertise, alongside the requirement for technical models to effectively review FDPs. It will be important to identify and prioritise filling the capacity gaps considering the outlook for the sector (e.g. 1 FDP vs 4 FDPs, resource prospectivity) and develop a resourcing plan to build national capacity. This should include actions in the short term to address pressing FDP needs.

Hiring talent can be an effective way to source experienced individuals to be able to pinpoint the points of greatest value for the country in the FDP process – both from value “creation” and “protection”. When experts are hired, the contractual terms should include specific actions and timeframes for documentation, mentoring/coaching to facilitate knowledge transfer.

The government should also seek to leverage seasoned professionals with transferable skills from other sectors. For example, engineers from mining or construction sectors and accountants from financial services. Targeted training of such individuals can be an effective way to accelerate the building of national expertise.

6. Ensure internal government process for approving FDPs

Management of the petroleum sector is a complex web of inter-related and competing demands and interests across many government agencies. An integrated approach is needed to coordinate across sectors and leverage scarce financial resources/technical experts to support the attainment of the nation’s development goals.

It is important to recognise that as a single project, the FDP cannot simultaneously satisfy all of the government’s objectives. Especially if it is the country’s first petroleum development.

Misalignments among government agencies can be exploited to the disadvantage of the country. This is exacerbated in jurisdictions with weak regulatory frameworks and low capacity.

An optimal outcome for the country can only be achieved if there is a “whole of government” position. As per recommendation 1 – this should be viewed from the lens of not simply “FDP approval”, but at a minimum cover the “discovery to first production”. This requires early involvement from a broad range of stakeholders.

Given the multiple government objectives, it is important the government understands the trade-offs for a particular petroleum project and works with the operator to ensure the FDP is based on mutually accepted solutions. This should be carried out through an integrated, interdisciplinary and inter-sectoral approach

[Chapter 5](#) outlines a step-by-step guide on how to establish an integrated government process for the FDP.

7. Recognise importance of managing stakeholder expectations, need for transparency and communication

Unrealistic expectations about the potential benefits from a particular project can easily occur. It is vital that the government recognises this can delay FDP approval and first production and hence should be carefully managed. Provision of information to communities and the public on projects in a timely and effective manner can help temper expectations. It is important that the company's FDP submission includes a stakeholder engagement plan to effectively identify stakeholders and ensure they are consulted in a meaningful way over the life of the project.

8. Strategy to fund and develop government agencies, especially in pre-production phase

One of the key contributing factors of regulatory capture is the government's limited access to finance. This is a common barrier that limits the use of external expertise and the development of strong national institutions (e.g. inability to hire or retain experts within the public sector, procurement of specialist software or hardware). These challenges are especially acute prior to production as there is little or no government revenue from the sector.

This situation has worsened in the aftermath of the COVID-19 pandemic as government finances have been severely depleted and available resources have been prioritised towards recovery efforts. Furthermore, as a consequence of the climate crisis and the energy transition, many development agencies and donors are withdrawing support to the oil and gas sector. This is both in terms of technical and financial assistance.

In light of such circumstances, it is vital for Governments that are dealing with significant technical gaps to develop funding strategies to address them in the short and long term.

In the short term this could include prioritising the areas that can have the greatest impact. For example, is the greatest need in the environmental agencies who are tasked with reviewing ESIA's? Or is it in the agency providing economic analysis or reviewing the subsurface plans?

One area that could provide benefits indirectly is clarity on roles and responsibilities among agencies. This would avoid duplication of efforts and ease pressures on building similar capacity across multiple agencies.

In the longer term, the government may want to consider how the legal framework can support the use and funding of external experts for reviewing FDPs and more broadly government capacity building efforts. For example, provisions that expressly outline a clear transparent process for third party reviews (including treatment of such costs e.g. tax deductibility) can provide some assurance and comfort to both companies and Governments. Legal provisions can also specifically earmark a certain portion of annual training and development contributions towards government needs.

9. Adopt a risk and resilience approach to reviewing, approving and managing the FDP.

Given the significant risks associated with a petroleum project, a resilience approach can supplement the traditional risk management practices to ensure the country benefits from the development of the project.

Risk management involves (1) the identification of sources of uncertainty, which can be either positive (upside or opportunities) or negative (downside or threats) (2) the assessment of likelihood and impact of occurrence (3) putting measures in place to deal with the risk e.g. eliminating, reducing, transferring or mitigating. Resilience on the other hand, refers to the ability to anticipate, prepare, adapt and recover from adverse events and disruptions. Whilst both concepts are related, resilience is broader and geared towards ensuring that projects can “withstand” and “cope” with shocks.

Given the growing challenges facing the petroleum sector it is prudent for governments to understand how resilient new oil and gas projects are to potential future shocks. For example, the energy transition introduces several new uncertainties. How would project value and government take be impacted if oil or gas exports were subject to carbon border-adjustment taxes? How resilient is the project design? Are facilities built with additional buffers in anticipation of worsening climate change impacts? (e.g. storm surges, frequency of floods).

A ‘risk and resilience’ approach to approving the FDP would focus both company and government agencies on the longer-term horizon, anticipating disruptions and testing the project robustness to potential disruptions, especially in the longer-term (where the company may not be focussed on but the government should be).

10. Realisation of value to country requires flexibility and vigilance

The approval of the FDP is only the first step towards realisation of benefits from an oil and gas project to a country. As noted earlier, the FDP is subject to large uncertainty and there could be significant changes after it is approved. The legal framework should ensure the government is aware of these risks and the FDP processes are flexible to accommodate such events. Ongoing interactions between the operator and the regulator should enable efficient handling in such instances.

It is also important that there is effective communication to all relevant arms of government on changes to the FDP. This is especially so for the Ministry of Finance if there are changes to government revenue forecasts.

Approval of an FDP does not constitute the approval to engage in drilling, installation of facilities etc. as there would be separate approval processes for such activities. For benefits to flow, it requires firstly that petroleum activities are executed on time and budget as per the project plan (construction of facilities, drilling wells etc.). The regulator should ensure all project activity is in accordance with the FDP which requires ongoing monitoring and engagement with the operator.

The scale and consequences of disasters (environmental, lives, livelihoods) can easily exceed any economic benefits of petroleum projects. Extreme vigilance is required to ensure the operator is effectively managing risks and that mitigation measures are in place.

Please see [Appendix B](#) for a Summary Recommendation Checklist.

Chapter 4

Effective Regulatory Framework for FDPs

This chapter outlines the key elements for a robust regulatory framework for FDPs and considers the policy and legal frameworks among the key regulatory tools used by the government to guide management and development of the sector. It is one of the key factors that will influence the company's choice of how to develop the field (Figure 1.3).

Caveat: Please note that each country's regulatory framework must be reflective of its own national context, objectives, laws, institutional framework and capacities. The formulation of national policy and legal framework must be done in a comprehensive manner which requires specialists to diagnose elements of the existing framework (legal, fiscal, operational, environmental etc.) and make recommendations that are context appropriate. This chapter must not be seen as a substitute for this type of work and is primarily intended to identify some critical areas related to the FDP.

4.1 Policy framework checklist

Well-developed petroleum policies provide investors and the public with a clear statement of the government's long-term vision and guides how activities in the sector should be conducted. The strategic direction for the sector is usually addressed in documents such as the National Oil and Gas Policy, Gas Master Plan, Local Content Policy. These policies will outline the context, legal and institutional arrangements, key issues and the government's objectives.

To provide an effective overarching governance structure, policy positions must be realistic, coherent with other policies and laws and create clear linkages on how the sector is expected to contribute to the achievement of national development objectives.

These will clearly have an impact on new oil and gas projects – hence the FDP.

The government, as the resource owner, must ensure there is effective communication on key policy matters to the operator early in the Appraise phase. This is crucial to establish framing conditions for the company's appraisal and development strategies – *for the field and broader discovery area.*

In instances where there are no explicit national strategies and policies to inform FDP activities, *it is even more important* that the government provides guidance to companies on its expectations from the sector in a timely manner. Without such framing conditions, the company's preferred development solution may not optimally address certain issues.

The discussion with the operator on the policy framework as it relates to the FDP should cover the areas shown in Table 4.1.

Table 4.1 Key policy areas that impact FDPs

WHAT?	WHY?
Guiding principles	<p>Set expectations on the principles the FDP should be based on, which will inform decisions and interactions among stakeholders.</p> <p>A principled approach can set the government's expectations and form a useful basis for dealing with matters related to the FDP, for both companies and the public. Some commonly used principles, which prudent competent companies would already be operating under, include:</p> <ul style="list-style-type: none">– Precautionary principle: where there are threats of serious or irreversible harm to society or the environment, the lack of full scientific certainty regarding the extent of that damage should not be used as a reason for not including measures in the FDP to prevent or minimize such potential adverse effects.– Public participation: A participatory approach often builds stakeholder confidence and is of particular significance for Indigenous Groups such as Free Prior Informed Consent. The FDP should consider and plan for public consultations.– Transparency and accountability: The underlying assumptions and expected risks and benefits from the project should be available to relevant stakeholders in a timely manner. The FDP approval should be carried out in a clear, transparent process with sufficient checks and balance in the system to protect the country's interests.– Collaborative approach: There will be differences, and therefore solutions to optimise the net benefits to both the country and company requires both parties to work together. <p>To provide clarity on the roles of various government agencies as they relate to the FDP approval and project progression to first production.</p> <p>Highlights potential areas the company may have not considered (e.g. various government approvals required during the construction phase) and incorporate into the project schedule. This supports effective coordination, communication and information sharing between the company and government.</p> <p>It would also serve to highlight where intra-government coordination is required.</p>
Institutional arrangements	

Government's policy objectives and priorities

To provide guidance to the company on the factors which should inform the development concepts being contemplated for the field. This should aid in early identification of issues and challenges specific to the FDP, particularly given different time horizons and interests between the government and company. Should allow for collaboration between parties for mutually acceptable solutions for the project.

Government policy objectives will vary depending on national context. Generally, they often include:

- Ensuring sustainable development of petroleum resources
- Ensuring the regulatory framework is consistent with international best practice
- Creating a competitive environment for attracting and sustaining investments
- Maximising economic recovery of petroleum resources
- Maximising the benefits for present and future generations
- The role of the state including state participation
- Promoting third-party access to infrastructure on fair and reasonable terms
- Ensuring safety
- Preserving and protecting the environment
- Local content (please see below)
- Capacity building

Local content

To set the government's expectations for local content and facilitate mutually acceptable solutions for the project on employment, local goods and services etc.

The objective of Local Content Policies (LCPs) is to ensure the sector brings benefits to communities and the national economy through employment, use of local goods and services and local participation in the value chain.

However, without analysis and a strategic approach to inform the focus areas and pace of adoption, the objectives of LCPs may not be realised. On one hand, opportunities for local content may be missed if not properly analysed or considered on a wider industry approach. And on the other, unrealistic targets may lead to schedule delays, higher costs and lower investment compromising the viability of the industry.

The scale of the opportunity for local business contracts and jobs increases as a project moves from the exploration phase through to production and should be carefully considered in the FDP; in particular, procurement strategies, organisation structure and manpower planning.

(Continued)

Table 4.1 (Continued)

WHAT?	WHY?
<p>Role of the oil and gas sector in domestic energy and its contribution to NDCs</p>	<p>To ensure the FDP is aligned with the country's energy policy and Nationally Determined Contributions (NDCs).</p> <p>NDCs are international commitments made under the Paris Agreement including mitigation and adaptation efforts. Every country based on their own national context, circumstances, capabilities, and priorities submitted plans for reducing global greenhouse gas (GHG) emissions. As the energy sector is a key contributor to GHG, the NDCs should be aligned to the country's energy policy which would describe the future energy demand of the country (e.g. transport, industry and power needs) and how that demand is anticipated to be met (i.e. oil, gas, coal, renewable energy or nuclear power). The intended energy supply/energy mix would outline the contribution from various energy sources including from indigenous supply. It will be important for government agencies to have a clear and integrated view of the country's energy policy, NDCs and the role of the oil and gas sector. For example, misalignment could arise if the NDC commits to 100% renewable energy by 2040 but given significant discoveries, gas power is being developed.</p> <p>A field's development will therefore have serious implications for the country's energy mix and NDC through areas which raise questions, such as:</p> <ul style="list-style-type: none"> i Will monetisation be via export or domestic markets? Will gas be used for domestic power? Will crude be refined in country? ii How will the project's GHG footprint be minimised? For example, are operations powered by renewable energy (vs oil and gas)? Is the design and operations of facilities based on zero routine flaring and venting? iii How will the project design incorporate effective monitoring reporting and validation of GHG emissions as part of its environmental management systems?

4.2 Legal framework checklist

The legal framework consists of the laws, regulations and contracts that govern operations and interactions in the petroleum sector. Sector-specific instruments are the Petroleum Act, Petroleum Regulations and Petroleum Agreements (e.g. concessions, production-sharing contracts). There are several cross-cutting aspects which will be addressed in other sectors. For example, laws and regulations that relate to state enterprises, environment, taxation, local content, labour, health and safety.

A robust legal setting gives weight to government strategies and policies. It would also ensure that the industry is developed in accordance with best international practice. Please note that for effective petroleum sector governance the legal framework covers the broad spectrum of administration, operational, environment, health, social and fiscal matters across the entirety of the petroleum life cycle i.e exploration, development, production and decommissioning. The FDP is an extremely narrow aspect of sector governance.

This section provides *guidance only on procedural matters related to the regulatory approval of the FDP*. Broader legal framework issues are outside the scope of this handbook.

Checklist for legal framework

The checklist below is intended to be used as a guide for testing the robustness of the existing requirements related to the FDP. Depending on the circumstances and the needs, the checklist can serve different purposes including supporting legal reform and improving governance. A supporting excel template is included in the toolkit to aid in assessing the robustness of the existing FDP legal requirements. (please see [Appendix C](#))

The legal framework should address the following:

(1) Discovery to Development Process

The FDP process should be viewed as starting from Discovery (refer to [Chapter 3](#) and [Section 1.2](#)), as choices made during the Appraisal phase have significant implications for subsequent project development decisions. This is especially true with regard to the unique role that data gathering plays in reducing uncertainty and which needs to be balanced with costs and initial views on commerciality.

The awarding of petroleum rights covers 1) an Exploration Period with relinquishment requirements and 2) the Production Period. The approval of an FDP is usually the basis for entering into the Production Period. The Discovery and Development process must therefore be consistent with the manner in which petroleum rights are awarded and acreage is relinquished.

Notification of Discovery

- Is there a stipulated time period for informing the regulator of the discovery?

This is typically immediate notification, followed by details provided within a specified number of days, including preliminary assessment on whether the discovery extends beyond the contract area.

- Is there a requirement to furnish the regulator with copies of data, analysis and a technical assessment of the discovery? Is the timeframe for such reporting to the regulator clearly specified?
- Is there an obligation for the operator to furnish additional information related to the discovery as requested by the government?
- Is there a specified timeframe for the operator to notify the regulator whether the discovery is of potential commercial interest and hence requires appraisal?
- If the operator notifies the regulator that it will not appraise the discovery, is there a clear linkage with relinquishment requirements?

Appraisal

- Is there a specified time period during which appraisal activities need to be completed? i.e. Is the duration of the Appraisal period clear?
- Is the process for extensions to the Appraisal period clear and transparent? Are the criteria, duration and conditions for extensions clearly established?
- Is there an obligation that an operator shall not commence appraisal activities without an approved Appraisal programme?
- Is there a requirement for the operator to submit a proposed Appraisal programme to the regulator for approval within a specified timeframe? Is it clear what the consequences are if the operator fails to submit in accordance with stipulated timeframe?
- Are the contents of an Appraisal programme clearly specified?
- Is there an obligation that operator shall not vary an approved Appraisal programme without prior written approval from the regulator?
- Is there a requirement to furnish the regulator with copies of samples, data and analysis?
- Is there a requirement to provide the regulator with an Appraisal report, setting forth all relevant technical and economic information in evaluating whether the discovery can be technically and commercially viable?

- Is there a specified timeframe for notifying the regulator whether the discovery is a commercial discovery? To be referred to as Declaration of Commercial Discovery.
- If the operator notifies the regulator that the discovery is not a commercial discovery, is there a clear linkage with relinquishment requirements?
- Is there an obligation for the operator to furnish additional information as requested?

Field Development Plan (FDP)

- Is there an obligation that petroleum operations must be performed in accordance with an approved FDP?
- Is there a specified timeframe after Declaration of Commercial Discovery that an FDP must be submitted to the regulator? Is it clear what the FDP submission timeframes and treatment is for natural gas? Is it clear what the consequences are if timelines are not adhered to?

Due to the additional complexities associated with monetising natural gas, there are usually different timeframes, specific regulatory requirements and controls to promote effective development of such discoveries (not within the scope of this toolkit).

- Is there a mechanism for ongoing engagement between the government and operator during the development of the FDP? Does it enable the government to be fully informed during the development of the proposed FDP?
 - Are there regular meetings at the petroleum agreement level to allow timely review of critical milestones e.g. joint management meetings
- Are the contents of an FDP clearly specified?

The government should provide detailed guidance to the operator on the contents of the proposed FDP. Many countries supplement the legal requirements with technical guidelines. See [Appendix A: FDP Submission Guidelines](#)

- Is an Environmental and Social Impact Assessment required as part of the FDP submission?
- Does the approval process provide for the use of independent specialists to support the government's review of the proposed FDP? Is it clear how this will be funded? Is it clear how independent advisers are treated for cost recovery and tax purposes?
- Is there a clear transparent process for the approval of the FDP?
 - Are there conditions and criteria that must be met for approval?

- Is there a specified timeframe for the government to inform the operator on its decision? Does this timeframe enable the government to conduct an independent review of the FDP?
 - Are there appropriate checks and balances on the decisions? For example, recommendations made by the regulator, approval by minister? Or cabinet or Parliament review?
- Is there a process established to resolve disputes on the FDP if they arise?

(2) Ongoing FDP Monitoring and Compliance

- Are all future activities required to be consistent with the approved FDP? e.g. Are annual work programmes and budgets required to be in accordance with the FDP?
- Does any material deviation, or alteration to, an approved FDP require the regulator's prior written approval?
- Is the operator required to provide notification in writing of any material change, or anticipated material change, in an approved FDP?
- Is the form and content of a request to vary or amend the FDP clearly specified?
- Is there a clear transparent process for the approval of FDP?
- Are there conditions and criteria that must be met for approval?
 - Is there a specified timeframe for the government to inform the operator on its decision? Does this timeframe enable the government to conduct an independent review of the FDP?
 - Are there appropriate checks and balances on the decisions? For example, recommendations made by regulator, approval by minister. Or cabinet or Parliament review?
- Does the approval process provide for the use of independent specialists to support the government's review of the proposed variation? Is it clear how this will be funded? Is it clear how independent advisers are treated for cost recovery and tax purposes?

Please refer to the following tools related to the legal framework for FDPs:

- [Appendix C](#) for a legal checklist to aid in assessing the robustness of the existing FDP legal requirements.
- [Appendix D](#) contains illustrative model provisions that consider the above matters.

Chapter 5

Effective Management of the FDP Process

5.1 Key interactions for developing and approving FDPs

The FDP is a complex undertaking which requires an integrated multi-disciplinary project management process from both the companies and government. Effective development, review and approval of the FDP requires a structured series of interactions amongst the key stakeholders and broadly are in the following areas:

- 1) **Operator-led interactions on the FDP:** The key processes the operator will have to manage to seek various levels of agreement for the project to reach fruition are:
 - Internal approvals: as described in [Section 1.2](#), each company should have a stage-gate approach to developing a project and obtaining senior management approvals as the project progresses from discovery to first production. It is important to note that not all companies have the internal expertise to develop all aspects of an FDP and often will utilise external advisers.
 - Partner approvals: The Joint Operating Agreement (JOA) is the typical governing framework when there are multiple owners in an upstream petroleum project. The JOA will stipulate the interactions and approvals for the FDP among partners before it is to be submitted to the government. As part of reaching consensus among JV partners, a series of technical and commercial reviews would be undertaken.
 - Government approval in line with the regulatory requirements. This is typically granted by either the Minister or Regulator for the FDP. Other approvals will be needed depending on the nature of the project e.g. Ministry of Public Utilities and Transport for pipeline and facilities
 - Financiers' approval. Any external funders would also have specific requirements that the operator would have to factor into its planning process.
 - Consultations with community, NGOs etc: The company must plan for effective engagement with local communities etc as consultations and Free Prior Informed Consent (FPIC) is a requirement in some jurisdictions (in particular Indigenous Peoples).
- 2) **Government-Operator interactions on the FDP.** The legal framework will outline the procedures and frequency of interactions between the operator and the various government institutions. In so far as practical, discussions

between the operator and regulator on the FDP should leverage those processes. For example, via the Joint Management Committee (JMC) or in Technical Coordination Meetings. If the legal framework does not clearly provide for such ongoing engagements, it is in the best interests of both the operator and the government to nonetheless establish such a process.

As it pertains to the FDP, the government and operator should meet as soon as practical to set expectations and agree a front-end loaded FDP engagement plan. This would represent a critical shift from the government being involved when the FDP is officially submitted, to being involved as key decisions are made. This proactive approach throughout the development process would result in earlier alignment and efficient technical assurance. It should also result in faster review of a submitted FDP as the government would be familiar with all critical elements contained within.

Working in collaboration with the operator, the government should have at a minimum:

- A clear understanding of the operator's project management process that will be used and the key decision points. i.e. Appraise/Select/Define, key milestones, authorisations and supporting documents (e.g. concept selection).
 - The project schedule for the discovery – which will include timelines, key project milestones and critical path deliverables.
 - A focal point from the operator for FDP matters. As the project progresses, it is common industry practice for a project team to be constituted with a project manager. Understanding the organisational structure and key contacts should facilitate information sharing and communication.
 - Scheduled periodic integrated technical and commercial reviews. Establishing a cadence of formal government reviews with operator aligned to the timing of the project's internal key stage gate investment decision points. It should also include specific documentation required to be provided to the government at each stage. These reviews should take place in tandem with the project as it fosters internal assurance. This will help to identify potential areas of misalignment between the government and operator and also provide a mechanism to finding mutually acceptable solutions early on.
- 3) **Government-to-government interactions.** In order to have effective engagements with the operator it is vital the government establishes a structured process that promotes effective coordination and cooperation among the various government institutions (e.g. ministries, agencies, departments, state-owned enterprise) involved in the FDP. As the project moves through the Appraise/Select/Define Phases, this would enable each arm of the government to understand:

- The priorities and objectives of each institution and what can be realistically undertaken in the specific project being reviewed (create strategic alignment).
- Which institutions need to be involved at each specific stage, and what information is required by each. This will help to assign government officials' scarce time to when it is most needed.
- Clear timeframes that each approving or recommending authority will have to conduct their review of the FDP. This will help each institution to plan in advance in order to perform tasks in a timely manner.
- Clear understanding of the type of external expertise required to enable the adequate provision of time and money. It is vital that governments faced with capacity constraints and low industry experience utilise external experts to guard against regulatory capture.

5.2 Why is an internal government process required?

The operator uses an integrated multi-disciplinary project management process to create the FDP. The effective review by the government of the FDP will similarly require a multidisciplinary approach which will need a high degree of inter-agency co-ordination. This is because, whilst the operator submits the FDP to the regulator, the requisite expertise and “approval rights” will be spread across other ministries or agencies.

Establishing an internal government FDP process will enable coordination and can also help address several challenges that government officials face (as outlined in [Chapter 2](#)). This would provide the following benefits:

- Clarify roles and responsibilities among different government institutions. This should help in the efficient deployment of scarce governmental human and financial resources (avoidance of duplication of efforts).
- Provide a robust and consensually agreed government position for engaging with companies. A multidisciplinary/multiagency team should enable sharing of different perspectives, prioritisation of government objectives, identification of potential misalignments and provide a mechanism for resolution. A “whole of government” approach would also reduce the ability of companies to “play one agency off another”.
- Ensure maximisation of value to the country from the FDP. A proactive approach increases the ability of the government to safeguard the country's interests. The government will be engaged in the early stages of developing the FDP where the potential to influence project outcomes is greatest. Hence the opportunity to increase value to the country is higher.
- Facilitate communication and sharing of information. The process should also identify the information required by various agencies. The government

should seek to leverage existing reporting and technical review meetings with the operator (e.g. via a Joint Management Committee under the petroleum agreement). Streamlined information sharing would reduce the administrative burden and also facilitate stronger communication in the government-operator relationship.

- Enable efficient and effective government review of all aspects of the FDP. Sufficient planning could help provide timely technical assurance and early identification of critical issues to be addressed by the operator. An Intra-Governmental Team (IGT) should help overcome coordination obstacles between agencies. It would also aid in assessing relevant expertise in a timely manner to ensure effective technical assurance of the FDP. Sufficient planning may also reduce the timing and funding constraints associated with the use of external advisers. Overall this should expedite the review process without sacrificing national interests. This would also likely increase confidence in management of the sector.
- Aid in capacity building. In instances where there are multiple FDPs, it can enable transferring of learning from one FDP to the other. If external advisers are used, they can be a useful mechanism for mentoring and knowledge transfer.
- May also aid in minimising political interference if established as standard practice.

5.3 How to develop an integrated internal government FDP process

The steps below can be used as a guide when developing an integrated government FDP process.

Step 1: Establishing an Intra-Governmental Team (IGT). The composition and empowerment of the IGT would be central to effective stewardship of the FDP process. This would require:

- a A clear mandate. The IGT should be established with the ability to make decisions and recommendations on behalf of the respective agencies. The purpose of the IGT would be to ensure that the FDP is developed in alignment with government objectives, to provide technical assurance of the submitted plan and to ensure value is optimised for the country. Terms of Reference may prove useful for clarity on the IGT's mandate, scope of activities and also enable political support for the IGT.
- b A “Coordinating” Institution. The government institution that has the statutory role of approving the FDP, or making recommendations for approval, would naturally play a co-ordinating role. Depending on the legal framework, this may not necessarily be straightforward and hence should be identified to

Table 5.1 Key skills needed for FDP review

FDP Thematic areas	Skills/Expertise required
Strategic Issues: Area development, unitisation, monetisation of gas Subsurface	Strategy, industry experience
Wells Facilities and Operations	Geologist, Geophysicist, Reservoir Engineer, Petroleum Engineer Drilling Engineer, Completion Engineer Production, Facilities, Pipeline Engineers, Logistics, Integrity Management, and standards SMEs
Health, Safety, Security and Environment Legal	HSSE advisor, Process safety Lawyers
Commercial and Financial	Economists, Commercial analysts, natural gas developments requires additional expertise

facilitate smooth IGT processes, including scheduling of meetings, circulation of reports etc.

c. Clearly defined roles and responsibilities.

The IGT would need access to skills and expertise to review the components of the FDP which are summarised in [Table 5.1](#). The government should consider whether it has the capacity to staff the IGT in each of the above listed areas using in-house resources or whether external advisers will be needed. The structure of the IGT should be informed by the government's plans for building a cadre of national experts. Where external experts are hired, the contractual terms should include specific actions and timeframes for documentation, mentoring/coaching to facilitate knowledge transfer.

These skills will most likely be available in different institutions and will be determined by the statutory role the various arms of government play. A holistic approach to the FDP process would consider the changing needs of the government across the different phases of the FDP as, in some instances, its duration may exceed two years (discovery to final investment decision). As such, the role of the IGT during the Appraise phase of the project will be different from when the FDP is officially submitted to the regulator and requires technical assurance of submitted documents and reports.

Performing a stakeholder mapping exercise would identify the relevant ministries and agencies etc. that would need to be involved in the FDP approval. Not every government agency or ministry or entity will need to participate directly in the FDP review process, or indeed be represented on the IGT, but maybe called to provide guidance, information, verification, and input when required. Relevant agencies or entities may include but not be limited to:

□ Ministry of Energy

- Ministry of the Environment or Environmental Management Agencies
- Ministry of Public Utilities – Power, Telecommunications, Water
- Ministry of Transport – Civil Aviation Authority and Marine authorities
- Ministry of Health
- Ministry of Local Planning, Development, and Infrastructure – facilities, access, transport routes, ports
- Ministry of Social and Community Development
- Ministry of Labour
- Ministry of Agriculture/Natural Resources – fisheries department
- Ministry of Finance including customs, revenue authority departments

A RASCI matrix would help to clarify the roles of each identified government entity across the FDP review process from Appraise through to Operate.

The RASCI tool ascribes five types of roles in a collaborative approach to decision making which are Responsible (person who does the task), Accountable (decision maker), Supports (e.g. providing knowledge or resources), Consulted (knowledge sources etc. whose collaboration is necessary to achieve task) and Informed. An illustrative example is shown in [Table 5.2](#) wherein the minister provides the decision on whether the FDP is approved. For subsurface matters the regulator is the entity that will review the FDP and provide technical assurance, and will need to inform the NOC and require support from the Ministry of Environment.

Table 5.2 Illustrative example of RASCI Matrix

	Ministry	Regulator	NOC	Ministry of Finance	Ministry of Environment	Ministry of Energy/ Planning etc
Strategic Issues	R	C	I	S	C	A	
Subsurface	A	R	I		S		
Facilities Design							
Drilling & Completion							
Health Safety	A	S	S	I	R	S	
Environment							
Economic/ Commercial	A	S	S	R	C	I	
Social, Community							

Step 2: Establishing IGT protocols. The IGT members working collectively should have a shared understanding of:

- a Chairperson and focal point for the FDP. This individual should be a sufficiently experienced and senior member of the IGT.
- b Communication and meeting protocols.
 - o IGT meeting frequency and objectives. These should be aligned to operator-government scheduled reviews. Particular attention should be paid to ensure alignment with the operator's project management process, timelines and key milestones. It is natural that meetings will intensify at critical junctures of the project and when the FDP has been submitted.
 - o IGT-operator. Clear mechanisms for two-way communication should be established between the IGT and the operator. In most instances, this would be part of the existing regulatory oversight processes, for example via the Joint Management Committee. Whilst care should be taken to avoid creating burdensome and duplicative protocols it is important that there is clarity on how information will be provided to the IGT, especially with respect to the timing of reports and findings. Equally as important is the clarity on how feedback will be provided to the operator in a timely manner.
 - o IGT members communication with principals. Part of each IGT member's role must be to ensure that they disseminate information and provide project updates to the relevant minister as well as counterparts who may not attend IGT meetings.
- c Process for categorising and working through issues. This would include:
 - o Ensuring the operator will be submitting an FDP that meets governments' requirements. In country's with relatively old legal frameworks, this will require assessing the national requirements (see [Appendix C](#)) and thereafter working with the operator to resolve any gaps. The use of technical submission guidelines may be useful in this regard. Please see [Appendix A](#).
 - o Resolving identified issues and misalignments between government institutions. One of the first items for the IGT to address is ensuring a shared understanding of government objectives from the project that will be reviewed. Each institution should identify government objectives and expectations for their relevant areas in the FDP. This would help to provide clarity on government strategic drivers, and identify potential misalignments (please see [Section 2.3](#) for some examples). This IGT should provide a mechanism to enable discussion on trade-offs and help to establish a whole-of-government position. This would enable the regulator to provide clear guidance to the operator on government expectations for the FDP in the early planning stages of the process.

- o Resolving identified issues and misalignments between operator and government (represented as a singular IGT position). It is inevitable that there will be differences between the operator and government. A system should be put in place for these to be resolved in a timely fashion. For example, “critical” or “strategic” matters which will have significant bearing on project design, versus areas for clarification. Maintaining an ongoing list of matters, or a dashboard or tracking tool for these, would prove vital over the course of the project lifecycle.
- d Decision making and escalation protocols. If agreement on critical issues cannot be resolved within the IGT, how will they be managed? This may not present in technical matters but may be of particular relevance on strategic issues.

Step 3: Ongoing IGT engagement and Communication during FDP. It would be natural that as the project matures IGT engagement would increase.

Step 4: Close out and lessons learnt. The IGT should undertake an evaluation of the process and outcomes to ascertain what worked well and where there were opportunities for improvements. This would help to create a basis for knowledge transfer, as well as increasing efficiency within the system.

Appendix A

Model Template for Developing National FDP Submission Guidelines

Appendix A

Model Template for Developing National FDP Submission Guidelines

How to use this template

This document has been developed as part of the Commonwealth Secretariat publication *Field Development Plans (FDP): Handbook for Government Officials*. It is intended to support national efforts to ensure that hydrocarbon resources are sustainably developed. This **model template** can be tailored to produce country-specific FDP Submission Guidelines to aid in strengthening the regulatory framework for FDPs. National FDP Submission Guidelines should be publicly available and provide information to companies on the process and the contents of the submission for government approval.

The model template has been developed to ensure government officials receive all relevant information to enable an informed decision on whether the FDP should be approved. It has been informed by international best practice from publicly available Guidelines, materials and submissions including from Alaska, Brunei Darussalam, Gulf of Mexico, Norway, Trinidad and Tobago and the United Kingdom, and can be modified to suit the circumstances of the member country. In developing effective national guidelines from this template, the following conditions must be met:

- National FDP Submission Guidelines must be aligned with appropriate national policies, laws, regulations and petroleum agreements.
- National styles and approaches will vary but the FDP submitted to the government should address all elements contained within the guidelines.

How to use...

- 1) It is highly recommended that the entity to which the operator submits the FDP should lead efforts to develop national guidelines. Customising the template should be done with the appropriate government institutions which will be involved in reviewing the submitted FDP.
- 2) Orange colour font has been used within brackets as placeholders throughout the template. Please insert appropriate references.
- 3) Explanatory notes have been provided in various sections (either as text boxes or in grey font) to provide some context on inclusion and risk if not adequately addressed in the FDP. These are meant to be deleted.

Please note that the Commonwealth Secretariat experts are available upon request to assist member countries in the development of national guidelines.

[INSERT COUNTRY]

Field Development Plans

Submission Guidelines

Title of Document: [FDP Submission Guidelines]

Date of Issue: [September 2021]

Issuing Authority: [Ministry of Petroleum]

Explanatory Notes:

Please note importance of providing version control for national guidelines.

At a minimum, please include the *Date of Issue* and *the Issuing Authority*.

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Section 1: Objectives of National FDP Submission Guidelines

Explanatory Notes:

This section is intended to provide a clear overview to the operators on the national context, including:

- The regulatory framework for the FDP
- The FDP process including the government’s expectations on how it is to be engaged during the development of the FDP. This will help the operator incorporate and plan for those interactions as part of its project planning.
- The criteria the FDP will have to satisfactorily meet in order to secure approval. This will help guide the operator to ensure these areas are adequately addressed as it develops the FDP.

The following are suggested section headings and illustrative text which should be replaced with country-specific content.

1. Purpose of guidelines

This guideline sets out the government’s requirements for oil and gas operators in the preparation and submission of a Field Development Plan (FDP) to the [insert REGULATOR].

The [REGULATOR], pursuant to the [PETROLEUM ACT or GOVERNING LEGISLATION] is responsible for management of petroleum operations and an FDP is required under Section [indicate specific provision in Legislative Instrument].

The guidelines are generally applicable and are subordinate to the Acts and the corresponding regulations made thereunder. The objective is thus to...

- Clearly outline government expectations regarding the development of FDPs;
- Provide clarity on the form and contents of the FDP including supporting technical analysis and information to be submitted;
- Promote cooperation between operators and the [REGULATOR] for timely and efficient review and approval of FDPs;
- Provide transparency on the criteria for FDP approval;
- Make appropriate information on the project available to the public.

2. Regulatory framework

Notes: This section should provide a list of relevant policies and legislation including those related to Environmental and Social Impact Assessments (ESIAs). It is recommended that the specific details are not repeated within these guidelines, but clear references to sections within National Acts and Regulations etc. are provided.

The operator shall not enter into significant contractual obligations unless the FDP has been approved. If there is an exceptional case where the operator deems entering a particular contract prior to FDP approval is critical, an application may be made seeking approval for such. The operator must demonstrate the disadvantages/negative impacts of awaiting FDP approval and commitment. Where consent is granted, it shall not prejudice the outcome of the government's review of the FDP.

3. Government-operator interactions

The government recognises that the nature and complexity of a particular oil and gas project will have implications on the FDP submission. Additionally, as companies' circumstances and project management processes for progressing a discovery to first production differ, they could also have implications and in particular will influence the timing (e.g. at concept select or closer to final investment decision "FID"), availability of information and uncertainties contained in submissions. Consultative and collaborative approach will help both the operator and government to prepare and effectively deal with issues as they arise during the development of the FDP.

The operator is thus expected to involve the relevant government agencies during the planning phase of a new project to facilitate efficient approval of the FDP. This will help to identify any potential issues early in the process, enable timely resolution of mutually acceptable solutions and facilitate efficient processing of submitted FDPs. In furtherance of this...

- The operator should consult with [the Regulator] and establish government reviews on the development of the FDP, especially at critical milestones. *[As far as possible, engagements on the FDP should be done via the existing technical review meetings between the Regulator and the company. For example, via the Joint Management Committee/Technical Coordination Committee under the Petroleum Agreement.]*
- [The Regulator] expects the operator to provide, at a minimum, the following in the period prior to submission of the FDP; Field delimitation, volumetric assessments – hydrocarbons in place.
- It is recommended that the operator furnishes [the Regulator] with copies of studies and analysis to support the conclusions reached, or positions taken in the proposed FDP in a timely manner.

After approval, the operator shall perform all subsequent activity in accordance with the FDP. Annual work plans and budgets are therefore to be consistent with the approved FDP and any deviation will require government approval. The government expects the operator to maintain ongoing interactions and provide early indications of potential variations that will be requested. This will help identify any potential issues as they arise and enable timely resolution of mutually acceptable solutions.

4. FDP submissions and approvals

For a submission to be considered valid, it requires...

- 1) The *proposed FDP*, or *proposal for variation to an approved FDP*, to be submitted within stipulated timeframe as per regulations/petroleum agreement [*For example, XX days after declaration of commercial discovery*].
- 2) The submission contents must conform to government guidelines. Please see Section 2 of these guidelines for *Proposed FDP* and Section 3 for *Variation to an Approved FDP*.

The submission must be in the form and manner stipulated by the regulator. [Please replace with details on how the operator should submit its proposals and the format required. For example, “*Please submit two hard copies and an electronic copy in text-search format to regulator, as well as hard copies to the National Oil Company and the Ministry of Petroleum*”. Or “*Regulator uses a service platform to allow operators to send files securely. Please email regulator.gov to ensure that the FDP can be submitted as per time period described above*.” Or “*The operator should consult with the regulator on the number of hard copies of the FDP to be submitted in addition to the digital copy*.”

- 3) [*Any other requirements that the operator must meet should be described*]. For example, some jurisdictions use application forms for FDP variations and have accompanying fees.

The government recognises that no two projects are the same and will evaluate an FDP submission on the risks and rewards of the specific development. For approval of any project, the operator will have to demonstrate that...

- 1) The FDP is formulated in accordance with international best practice and promotes efficient and optimal recovery of petroleum resources;
- 2) Appropriate measures will be implemented to effectively manage health, safety, security and environmental risks across the project lifecycle, i.e., design, construction, production and decommissioning phases;
- 3) A robust stakeholder engagement plan will be developed and followed;
- 4) There are demonstrable financial benefits to [the COUNTRY] from the development;
- 5) The project minimises Green House Gas (GHG) emissions and is resilient to climate uncertainties.

The regulator will communicate the decision in writing [within XX days of FDP submission], including any conditions.

Section 2: Contents of an FDP submission

Explanatory Notes:

The FDP submission to the government should address all elements contained within this Template. The section headings and text should be replaced with country-specific terminology and content; however, the key areas should not be deleted. This template has been designed to ensure that information on the key aspects of any petroleum development is addressed in the request for approval.

Throughout the Guidelines, please ensure definitions are consistent and state specific technical standards, units and formats to provide clarity to operators and minimize re-submissions. For example

- In some legal frameworks, the terminology ‘field’ or ‘development area’ may have different meanings in the fiscal regime. Within these guidelines, ‘field’ is used to denote the petroleum deposits that the development is based on.
- What is the preferred Co-ordinate Reference System (CRS) to be used when referring to positioning? Latitude/longitude, UTM or both? Every country has a CRS list available for use. EPSG.io: Coordinate Systems Worldwide
- State units of measure. e.g. feet (ft) or meter (m).
- Are there any standard forms for data reporting?

The FDP submission should provide the government with a holistic view of the development project. This section outlines the relevant areas and information that should be provided. Pertinent information relevant and supplementary to the contents of the FDP should be submitted in the appendices or as separate attachments, where possible. These include reports, independent assessments, agreements, and other relevant material.

The government recognises that each project is different and, depending on its nature and complexity, some subsections may not be applicable. Or, conversely, more information may be required. The operator should consult with the regulator on the specifics of a submission to ensure all documentation is provided in a timely manner.

PART I: Executive Summary of FDP Submission

Explanatory Notes:

An FDP submission is a holistic view of a development and as such will be associated with many technical assessments and reports. If clear instructions are not provided on the structure of the FDP submission, the voluminous data can be overwhelming and to the detriment of understanding the critical assumptions behind the development and the inherent risks.

Best practice is for a succinct non-technical summary of the project (including risk management) and how the country will benefit from the development. This approach also has the added benefit of enabling this part of the FDP to be the basis for broader government discussions (e.g. cabinet and or Parliament) and for consultations (e.g. among government agencies or with the public).

This section should provide a comprehensive summary of the key components of the FDP submission. In effect, it is a brief overview of PART II of the FDP submission and it should enable a non-specialist reader to reach an informed opinion about the proposed development. More specifically, the summary should adequately address how the proposal meets the required conditions for approval as described in Section 1 of these guidelines.

It should include an overview of:

- The development strategy and preferred concept selected. Particulars of the contract area (map, beneficial ownership, exploration history, estimates of total petroleum deposits), development strategy for optimising petroleum recovery from the contract area, scope of the FDP (field location, petroleum deposits included), possible concepts and rationale for selected option including comparative economics. Indicate relevant assumptions and decision criteria.
- The proposed project. Range of estimates for resources and production, description of the drilling and completion campaign, facilities and infrastructure, expected operating efficiency and other key matters. Provide a summary table of a base case, upside and downside for key project parameters including hydrocarbons in place, recoverable resources, reserves, production, capital costs, operating costs.
- How Health, Safety, Security and the Environmental (HSSE) has been integrated into the design and operation of the proposed development. In particular provide summary of Section 6.6
- The decommissioning plan for the development

- The social and economic impacts of the project with description of the overall expected benefits to the country under three scenarios (base case, upside and downside).
- The project schedule, noting key milestones including first gas/oil date, critical path activities and measures that will be employed to effectively manage risks and ensure delivery of the project on time and budget.

PART II: FDP TECHNICAL ANALYSIS AND EVALUATION

Explanatory Notes:

The operator and government technical teams should be engaging throughout the process of moving from discovery to FDP submission. Ideally, the government technical teams should have line of sight to many of the supporting detailed assessments and reports ahead of the formal submission. It is thus recommended that, where possible, a synopsis of such reports is provided for the FDP submission. For completeness in the government's record keeping those submitted as appendices/separate attachments

Part II of the submission should provide a comprehensive review of the technical analysis and evaluation of the FDP elements. For each section the description should be brief and focused on the complexities and risks of the development. Where possible, appropriate documents and reports should be referenced and attached separately. Where a particular subsection is not relevant to a development, this should be discussed with [the Regulator] and omitted.

1. Contract Area Development Strategy and Scope of FDP

This section is to provide context on the FDP by providing details on the contract area and to describe how the proposed option (selected concept) for developing the nation's petroleum resources optimises value to the country and what the key risks are. Areas to be covered include:

1.1 Contract area description

Provide overview and status of the governing contract/licence (contract area, beneficial ownership, duration), exploration history, other planned activity which may have a bearing on the field, and other potential areas of development. Include a map showing the contract area, field location and where relevant other developments, prospects/leads. If appropriate, also describe other contract areas e.g. unitisation.

1.2 Area development strategy and scope of the FDP

Address the holistic strategy for development of petroleum resources in the contract area. Analysis of government revenue flows will be expected in support

of the development strategy. Please see required economic metrics. Clearly outline the scope of petroleum accumulations to be included in the FDP and estimates of other petroleum resources in the contract area which are not included. If appropriate, also describe the implications for other contract areas. For example, if there are discoveries or potential for such or existing developments in other contract areas. Specifically address the strategy for dealing with non-associated gas.

For multi-phase developments: If the operator considers it more advantageous or efficient to develop a field(s) in multiple phases, the rationale and assumptions should be clearly documented. The operator will need to demonstrate this type of phasing will not be detrimental to the development and the ultimate recovery of petroleum resources and value to the country. To the extent possible, information should be provided on each development phase including timeline, costs, future facilities integration, and requirements.

For unitisation developments: Summarise the key terms and conditions of the unitisation agreement which shall be attached as an appendix.

1.3 Development concepts and proposed project development option

Provide an overview of the development concepts considered and describe the rationale for selection of the preferred option and the robustness of the selected project. This should include...:

- Advantages/disadvantages associated with various options (e.g. resources, location, cost, technology, HSSE, economics etc.) and assumptions. Where relevant, a detailed account on the options for treatment of non-associated gas is to be provided (e.g. pressure maintenance or recycling, domestic use).
- Decision criteria and rationale for selected development concept. A comparison of project economics and government take on different development scenarios is to be provided. Include summary table for required economic metrics. If selected option includes any intended innovative or new technology applications provide justification for inclusion.
- An account of how flexibility has been incorporated into the proposed project given in [Section 1.2](#) and [1.3](#), particularly potential for tie-backs.
- What uncertainties (including future business opportunities) may require fundamental changes to the proposed development concept. How does the operator intend to manage those risks? *[This is to provide early indication of areas of the project that the regulator should subsequently pay attention to and engage with the operator re: potential request for variation to an approved FDP].*

2. Field Description

Please note the importance of alignment of definitions. In some legal frameworks, the terminology ‘field’ or ‘development area’ may have different meanings in the fiscal regime. Within these guidelines, ‘field’ is used to denote the petroleum deposits that the development is based on.

2.1 Field overview

Provide an overview of the field on which the proposed development has been based. Key elements to be included are:

- *Field location:* Maps showing the license area, co-ordinates, surface location of any proposed facility, structure or installation. Include aerial maps and cross-sections showing outlines of hydrocarbon-bearing reservoir segments and field limits.

For OFFSHORE locations: A bathymetric map showing the surface locations of nearby facilities/installations with surface and subsurface location of wells and water depths.

For ONSHORE locations: Cadastral sheets showing location of nearby infrastructure, houses/habitation, farms, pipelines, schools, rivers etc. All wells and their surface and subsurface locations (plus related facilities) must also be shown in the location map.

- Provide a brief description of technical aspects of the reservoir(s) and estimates of the hydrocarbons in place, the geological setting, trapping framework (stacked pay vs separate fault blocks) and reservoir aerial extents. At a minimum, a representative structure map, field cross-sectional view indicating the reservoirs of interest and the in-place volumes. Volumes to be shown for each appropriate reservoir unit(s) by oil/gas with description and quantification of the uncertainties.

2.2 Geology

Provide geological data together with all current interpretations and integrated analyses, including:

- Regional geology and tectonic context
- Well log 2D correlation panels, analyses and interpretations should reflect the basis for subdivisions, reservoir zonation and demonstrate reservoir continuity
- Field stratigraphic framework (reservoir and sequence) including chrono-stratigraphy and biostratigraphy
- Facies variations and other relevant geological factors that affect reservoir properties

- Type and composite logs
- Sedimentological, depositional models and studies
- Isopach, porosity, net to gross maps
- Field structural framework: structural restorations, Allan diagrams, fault maps, integration of dip meter/image data
- Reservoir compartmentalization – potential flow barriers and baffles, highly permeable layers
- Petroleum systems modelling and analyses

2.3 Geophysics

Provide geophysical data together with all current interpretations and integrated analyses including:

- Seismic surveys with shot-point maps and seismic datasets used for generating current interpretations
- Seismic interpretations including seismic-to-well ties demonstrated on interpreted 2D seismic sections through wells
- Depth conversion methodologies
- Modeling studies
- Velocity models, maps and 2D profiles
- Seismic interpretations on dip/strike cross sections of the reservoir structures
- Structural configuration of the field represented by top structure maps (depth/time) for the key reservoirs
- Reservoir characterization using attribute analysis techniques including coherency and spectral decomposition maps

2.4 Shallow hazard assessment

Demonstrate that seafloor, shallow and synthetic subsurface geohazards have been assessed and incorporated into facilities placement and drilling design. For example, describe results of any high resolution 2D/3D seismic interpretational analyses or studies that provide insights on slope stability and sediment surfaces, reservoir compaction and possible subsidence.

2.5 Petrophysics

Petrophysical data together with all current interpretations and integrated analyses, including:

- Well log analyses, reservoir zonation and data QC
- Core data and special core analysis (SCAL) including core porosity, vertical and horizontal permeability, initial saturations, capillary pressure, and relative permeability

- Comparison of laboratory analyses (core plug measurements and water analyses) with data derived from logs
- Average reservoir characteristics including porosity, permeability, initial water saturations, capillary pressure, relative permeability including cut-offs criteria
- Well test data
- Field PVT descriptions, formation temperatures
- Formation pressure analysis and interpretation
- Fluid chemistry and analyses including fluid composition and properties
- Pressure data, fluid contact assessment from well data
- Rock properties and modeling studies
- Petrophysical interpretation methodologies and findings
- Use of field analogues or correlations.
- Methods for correcting measure depth (MD) to true vertical depth (TVD) and true vertical thickness (TVT) to true stratigraphic thickness (TST)

2.6 Reservoir engineering

Provide reservoir engineering data together with all current interpretations and integrated analyses including:

- Fluid composition – quality, chemical, physical properties
- Fluid chemistry
- Fluid data analysis – PVT data and analysis of fluid responses present
- Reservoir gas PVT (gas condensate, wet, dry)
- Separator pressure, temperature, dew point pressure, GOR and CGR of gas reservoir at standard conditions
- Z factor, U_g and B_g
- Initial reservoir, saturation pressures, reservoir temperatures
- Saturated oil density, API, viscosity, B_o , CGR, GOR
- Rock-fluid interactions
- Pressure depletion studies
- Aquifer properties and reservoir drive mechanisms

2.7 Reservoir modelling and simulation

Dynamic reservoir modelling can be represented by either an analytical method, some form of numerical simulation or a combination of both. In this section, the specific modelling approach(s) used for the reservoirs, available datasets used and the basis for any subdivision into flow units and compartments should be described. Key discussion points should include but not be limited to:

- Outcomes of any material balance modelling work and any reservoir (geological) simulation models built for the reservoir(s) of interest, utilising seismic and geological, reservoir and flow unit descriptions, trajectories, fluid data, initial condition, historical production data and pressure performance data to forecast well and field performance for reservoirs in the planned development. Notable outcomes may include:
 - Discrepancies with calculated volume between static and dynamic volumes in place
 - Various drive/depletion mechanisms, extent, and strength of any aquifer(s)
 - Potential well trajectory optimisations
 - Impact of uncertainties and where applicable, any sensitivity analysis
 - Implications on history matching and predicted production performance where Drill Stem Testing (DST) data or Extended Well Tests (EWTs) information has been integrated for well optimisation

It should be noted that for a phased development where pressure and production data maybe available from existing phases, history matching should be done to give more accuracy in the prediction. It should be done for pressure, oil, gas, and water production data. In case of poor match, operators should highlight any adjustment in reservoir parameters.

In cases where there is insufficient data available, use of generic data should be highlighted.

2.8 Subsurface risk and reservoir-management plan

The operator is expected to describe subsurface uncertainties (positive and negative) that could impact the proposed development plan and mitigation strategies. Risks during pre-start up phases and post production should be discussed. This part of the FDP submission should include:

(1) Volumetrics and resource estimation

Describe the resource estimation methodology, volumetric assessments and uncertainty analyses conducted for the reservoirs in the planned development. For phased developments, the expected recovery rate and recoverable volumes should be presented for each phase. Discussion points should include:

- The initial hydrocarbons volumes in place
- The estimated oil, condensate and gas recoverable reserves and associated recovery factors under the selected development option
- Possible contingent resources
- Assigned resource and reserve categorizations (proven, probable, contingent) [Please see box below]
- Key assumptions underpinning the development's proposal

- Descriptions of the cause and degree of uncertainties in the estimates
- Recovery; evaluation of recovery strategies (e.g. depletion, pressure maintenance, aquifer support) and selection criteria for optimal drainage

Explanatory Notes: Reserves Reporting

The reserves estimate is inherently imprecise and will be revised over the life of a field. There are different reserve classifications used but estimates often expressed using “proved” and “unproved”. Unproved may include “probable” and “possible” or “contingent resources”. The government should provide guidance to the operator on the country’s reserves reporting guidelines. For example, Society of Petroleum Engineers (SPE) Petroleum Resources Management System (PRMS)

(2) Reservoir production strategy

Describe how the reservoir(s) will be produced and managed to maximize economic recovery of the overall development while adding value. As part of the reservoir production strategy discuss:

- The selected production strategy for the proposed plan, taking into consideration if it is a single phase or multi-phase development
- Short, medium and long-term production plans/schedule including impact on production acceleration and recoverable reserves
- Number of wells, well type (e.g. producer, injector) accompanied by perforation schemes and completion diagrams
- Stand-alone vs co-mingling reservoirs
- Recovery rate sensitivity analysis
- Fit-for-purpose technology to be implemented with known sensitivities and limitations/constraints
- Expected production profiles and recovery rates for oil, gas and condensate/NGL, water production for the entire field(s) and by reservoir zone or other production facilities, if applicable. Include upside, base case, and downside profile view with associated assumptions. Include some description but not limited to how the uncertainty regarding resources, recovery rates and start dates are considered.

For oil rims, the following additional information should be submitted to provide assurance around adequate GOR control, implemented prior to deliberate production of cap gas:

- Gas production control plan for each reservoir
- Solution gas/oil ratio (GOR) and recommendations for GOR control based on reservoir characterization, subsurface uncertainties, and field development and production plans

- Recommended produced GOR limit
- GOR monitoring plan, including key performance indicators (KPIs)

(3) Secondary recovery screening and methods

Describe evaluations of conventional and beyond conventional recovery methods such as enhanced oil recovery (EOR) and enhanced gas recovery (EGR), proposed to be deployed during life of field for the development. Describe outcomes of any EOR modelling studies or screening efforts. If enhanced oil recovery techniques are not being considered, the operator should justify why they are not being used.

(4) Reservoir and well performance

Where Drill Stem Tests (DSTs) or Extended Well Tests (EWTs) have been performed (during Appraisal phase), any possible implications of these on the field's future production performance should be noted. The potential for scaling, waxing, corrosion, sand production or other production issues should also be highlighted with potential mitigations for optimal reservoir management.

(5) Field depletion planning

The principles and objectives when making field management decisions, conducting field operations, and maximizing economic hydrocarbon recovery over the life of the field should be described and documented in a reservoir management plan (RMP). Key points for discussion include:

- If the field is to be developed in phases, a view of which reservoirs will be developed in each phase with the projected timings
- Any future technical studies and surveys considered
- Potential for re-completions, workovers, re-perforations, and further drilling
- Potential measures to increase available capacity over time
- Mapped and unproven deposits in the area that may generate opportunities for growth and additional production

(6) Field data acquisition plan and reservoir surveillance

Provide a detailed description of the key objectives and the subsurface data to be acquired for the proposed development during the relevant stages. This will help resolve or reduce existing uncertainties and assist with understanding dynamic performance.

Two key aspects to consider involve, firstly, data collection during the drilling phase of the development such as well logs, cuttings, cores, pressure, seismic VSP profiles and surface samples. And secondly data collection (field

monitoring and surveillance) once field comes on production such as pressure build up tests (PBUs). Discuss:

1. Justification/value of information (VOI) assessments and outcomes that support the planned data gathering program
2. Additional seismic data acquisition or execution of any seismic reprocessing work during the appraise-select phases
3. A proposed surveillance schedule for dynamic data capture post field startup and first production

Explanatory Notes:

Value of information (VOI) analysis evaluates the benefits of collecting additional information prior to making key subsurface decisions about data acquisition for the planned development to help reduce uncertainties.

VOIs are essential to underpin decisions around the type of data, quality of information being acquired and the value it brings to the development. This type of analysis can distinguish between constructive and superfluous information.

It is especially useful when considering data acquisition that is not the norm.

2.9 Database

A brief description of the integrated dataset used to support the definition of the subsurface activities and deliverables (e.g. field volumetric estimation, static and dynamic models) in the FDP.

Requirement	Content description to include but not limited to:
Geological, petrophysical & logging, fluids and well test data	All exploratory appraisal data taken from previous well(s) drilled and quality, including but not limited to log data, borehole data, core data, biostratigraphy data, pressure data, fluids and well tests
Seismic data	All seismic surveys and datasets used for appraisal and any reprocessed volumes used for current interpretations (incl. AVO products, velocity models) with details of data basis, aerial coverage and fold, vintages, quality of seismic data

3. Drilling and Completions (D&C)

The effective design and execution of drilling and completions activities are critical to successful delivery of expected outcomes to the country. It is important in maximizing production, cost efficiency (D&C is significant portion of capex and decommissioning spend) and carries significant HSE risks (blow-outs etc.). **The operator is to demonstrate how D&C activities conform to international best practices, support optimal petroleum recovery and how risks have been identified and will be managed.** This shall include information on:

3.1 D&C programme

Key aspects to include are:

- Drilling location and details of any site survey and assessments of land and seabed conditions for relevant features and hazards (e.g. geohazards such as shallow gas, hydrates, cables, pipelines, anchor-holding demands and sea traffic)
- Rig selection and procurement strategy. Provide specifications of the selected rig type (e.g. bottom supported, jack-ups or floating units, submersible, semi-submersible or drillship) and the rationale for selection (e.g. Onshore: portability and maximum operating depth. Offshore: water depth, meteorological and tidal conditions).
- Number, type of wells (e.g. producer/injector) and timing to produce petroleum deposits included in the FDP submission
- Provide rationale for approach to drilling activity (e.g. batch, pre-drilling of development wells)
- Cementing strategy and procedures. Discuss the criteria for zonal isolation during well construction and future abandonment phases
- Sand control measures and management strategies. Discuss any applicable field analogues
- Data acquisition plan e.g. coring, logs/logging while drilling (LWD), pressure tests, well integrity, leak-off tests (LOT)/formation integrity test (FIT) etc. [particular attention should be given to use of data for managing risks and uncertainties.]
- Discuss possible well work/well intervention plans and future application of well stimulation methods (hydraulic fracturing, acid stimulation jobs etc.)
- Approach for accessing key components, critical spare parts and back-up equipment with long lead times
- Costs estimates. Provide underlying assumptions for costs and benchmarking

3.2 Well design

The operator is not required to submit detailed basis of design (BoD), equipment designs and operating procedures in this section as these will be required as part of the approval process for drilling and completion activities. Such subsequent submissions should be consistent with Section 3.1 above, and any deviations must be explained. This section should describe the initial views on BoD and well design such as:

- Well path and reservoir target requirements. Describe scoping trajectories and drilling feasibility work or assessments to select optimal well paths to the reservoir target take points, as well as the relative simplicity/complexity of the wells. Include well placement spider plots with plan view layouts for either platform or subsea. Discuss well collision risks based on anti-collision work. For well paths close to lease boundaries, the positional uncertainties should be documented.
- Drilling design considerations and requirements including offset wells, wellbore stability studies and modelling, bit selection, casing design methodology, casing and liner setting depth considerations, HPPT design, drilling fluids and mud weights.
- Slot design, number of wells/manifolds, well slot/drilling pad locations
- Completion design and considerations including tubing size, completion type (OHGP, CHGP), number of zones (single vs multizone), use of intelligent completions and smart well technologies.
- Geological prognosis, uncertainties, and site survey information if available
- Temperature, pore pressure, and formation strength prognosis including pore pressure and frac gradient (PPFG) assessment.
- Wellhead systems and the Christmas trees (wet vs dry)
- Hole cleaning and hole stability requirements
- Production or injection requirements
- Offset well data analysis including non-productive time
- Safety and environmental protection measures

3.3 Safety and environmental-protection measures

Description of the safety and environmental protection measures particularly.

- Specifications of the Blow Out Preventer (BOP) system and blowout contingency plans. Key discussion points to include:
 - Evaluation of blowout scenarios and kills methods
 - Mobilization of necessary emergency equipment, personnel and services
 - Description of suitable locations for drilling of relief well(s)

- Evaluation of relief-well profiles and casing program
- Available equipment including possible rigs or facilities for well intervention options
- Plan for disposal of drill cuttings, chemical and fluid discharges

3.4 Plug and abandonment

Provide a brief description of the plug and abandonment strategy, design and estimated cost.

3.5 Risk management

Provide a description of potential technical and operational risks for the drilling program. Discuss any initial risk analyses done and outline mitigation plans.

4. Facilities and Export systems

This section should provide all relevant information on the proposed production and export system to take petroleum from the field to point of sale. Where analyses, reports and other documents can serve as supporting material/evidence, please include a summary of the relevant issues and include as separate attachments. The type and configuration of the production and processing facilities, storage, pipelines and transportation infrastructure can vary significantly. The evaluation of alternative concepts and rationale for the proposed development option should be discussed under Section 1. This section should provide details on the selected development option.

4.1 Production facilities

Provide an overview of:

- The basis of design, citing applicable laws/regulations, industry codes/standards, assumptions and considerations used for selected facility option such as:
 - Quantity and composition of the hydrocarbons
 - Seismic and subsidence considerations. If there is a risk of subsidence where the facility is to be installed, details should be given of the consequences this could have for the facilities, as well as which measures will be implemented to secure the facilities. A description of the impact of seismicity to the facilities and how they have been designed to withstand any seismic activity should be given. [e.g. Global standard design requirements exist for seismic events such as an event every 1000yrs vs 1 event every 10000yrs. Specify the codes that will be used for design level(strength)/safety(ductility) of the facility]
 - Meteorological and Oceanographic Conditions. The impact of weather conditions (normal and storm) on design and operability.
 - Vulnerabilities to potential climate change impacts

- Location and description of the facility and all major structures, plant, equipment and safety systems (e.g. design life, capacity, structure specifications). Detailed engineering drawings, schematics and illustrations to be provided. Discussion areas to include:
 - Proposed facility location, distance to nearby facilities and, for offshore developments, water depth and distance to shore
 - Configuration and layout
 - Drilling or workover equipment and systems
 - Equipment and systems for collecting, separating, processing and treating hydrocarbons, produced water, waste, drill cuttings, other discharges and emissions. If relevant, features to handle high-wax content or pour point problems
 - Fluid treatment and injection facilities
 - Process control and their interconnections with other facilities
 - Measuring, allocation and fiscal metering systems
 - Access routes. Primary and secondary access e.g. evacuation/rescue
 - Electrical/power systems, general utilities and energy efficiency
 - Accommodation
 - Safety equipment and systems including an account of safety/buffer/exclusion zones
- A process flow diagram, which indicates the fluid analyses, operating pressures, temperatures, throughput volumes and capacities.
- Overview of technical and risk evaluations completed to ensure proposed design and operation includes measures to ensure safety and protection of people, plant and the environment including the prevention and minimisation of discharges and emissions (e.g. flaring, methane and fugitive emissions).
- Cost estimates. Provide underlying assumptions for costs and benchmarking
- Potential system bottlenecks and limitations that may give rise to production constraints with details of contingencies to maintain production in the event of system failure(s).
- Flexibility to adapt to changes (e.g. resource base), potential satellite developments/tie-ins indicating spare capacity

For offshore fixed/floating systems, in addition to above also include:

- The marine systems of a floating structure including the general utilities and facilities for mooring, propulsion, and ballast.

- The functional requirements for systems such as well conductors, J-tubes, risers, riser handling, seawater supply and discharge, shale chute

For offshore subsea systems, in addition to above, also include:

- Satellite wells, clustered wells, or template wells
- Components such as well foundations, wellheads and trees, flowlines and end connections, production risers, controls, control lines and fluids, templates, manifolds, shutdown systems, materials and corrosion control
- Overpressure protection philosophy
- Intervention strategy

4.2 Transportation and export systems

Overview of the route and system for transporting hydrocarbons and other substances to and from facilities providing details listed under [Section 4.1](#), as appropriate.

4.3 Tie in with other fields and/or facilities

Discuss any tie-in aspects of the proposed development on sea or land.

- If existing facilities are to be used, provide a description, including any necessary modifications that would need to be completed, because of the planned tie-ins.
- Technical opportunities identified or assessments carried out on possible future tie ins of other hydrocarbon fields in the area of the planned facility.
- Analyses of any commercial and safety consequences for the field or facility proposed if third parties are to utilize the facilities, infrastructure, and services.
- Expected available capacity on the planned facility and potential measures to increase available capacity.
- If entering into any agreements for use of facilities owned by others, include documentation describing the key elements of the negotiation process and agreements made including tariffs, the physical and ownership boundaries between both parties.

4.4 Associated production and other profiles

Expected production profiles for total liquids, oil, gas, gas usage and flare, associated gas liquids and produced water for the life of the field are required. Where fluids are to be injected, annual and cumulative injection profiles should be provided.

5. Operations and Maintenance

This section should provide the expected overall operating efficiency (OE) and reliability of the proposed development and the detailed factors and plans for achieving them. The operator should provide a description of the:

- Operations and maintenance philosophy, strategy and processes and an account of how they have impacted the facility's design and equipment selection. e.g. the rationale for manned or unmanned installations/remote operations, system redundancies, predictive maintenance etc.
- Organisational structure and manpower requirements
- Approach towards inventory management (e.g. critical spare parts, back-up equipment with long lead times)
- Logistics operations and support systems (e.g. onshore supply base, support vessels, helicopters). (e.g. personnel movement for unmanned installations)
- Communication systems
- Reliability and integrity management plans including:
 - Elements that are critical to operations e.g. pump system, seals (risers etc.), Tank venting system, deck structures (e.g. walkways, plating)
 - Corrosion management plans
 - Inspection and maintenance plan e.g. surveillance equipment and procedures, scheduled maintenance, turnarounds and inspection programs (e.g. monitoring integrity of platform, pipeline, and other installations) and well workovers. Note if any special maintenance, inspection and repair equipment or vessels are required, and whether the intention is to acquire such vessels or to hire them on an "as-needed" basis.
- Expected overall operating efficiency (OE) and reliability of the proposed development. Underlying assumptions should be discussed, including system redundancies, well workovers and downtime (e.g. severe weather conditions)
- Key operational risks and plans for monitoring and management

6. Health, Safety, Security and the Environment (HSSE)

Demonstrate how Health, Safety, Security and the Environment (HSSE) have been integrated into the design and operation of the proposed development including management systems (e.g. policies, plans and procedures including as they relate to workforce and contractor management). Given HSSE applies to all aspects of a development and the integrated nature of the FDP it is possible that particular areas of this section may be cross-referenced if addressed in previous sections. The operator must demonstrate that appropriate measures (people, plant and processes) are in place to adequately: i) safeguard the workforce and public health and safety; ii) protect the environment and demonstrate that risks over the

project life are as low as reasonably practical (ALARP). The following areas should be covered:

6.1 HSSE philosophy, goals and objectives

Provide an overview of the HSSE philosophy, strategy, goals, performance standards and risk acceptance criteria.

6.2 Health

Overview of measures taken to safeguard the health of the workforce and the public including key sources of risk (e.g. noise, pollution, radiation etc.), how risks are minimized and managed such as air-quality control, portable water systems, health-service plans, health and medical facilities. [To be reviewed for compliance with national occupational, health and safety laws and regulations]

6.3 Safety

Explain how safety has been integrated into the design and operation of the proposed development in line with international best practice including:

- Safety management philosophy, processes and the safety management plan for the proposed development (may be covered under section 6.1)
- Summary of the hazard assessment (HAZOP) study. It is recommended that results of HAZID (hazard identification) study conducted during the conceptual design phase are furnished when available. HAZOP studies are to be provided as a separate attachment.
- An overview of standards and specifications that will apply to the development e.g. safety, buffer and exclusion zones around facilities/installations
- Overview of safety-related facilities and equipment
- Inspection, monitoring and management plan for the safety and integrity of wells, platforms, pipelines, and other installations.
- Waste management plan. Describe methods and location for collecting, storing, treating, transporting, and finally disposing of all appropriate residues and emissions (i.e. solid wastes, liquid effluents, gaseous and particulate emissions)
- Emergency response and contingency plans. Types of emergencies for which contingency plans will be established; the proposed emergency response organization, chain of command and key areas of responsibility; the training of personnel and response exercises; the estimated response time for major classes of emergencies; and planned participation in initiatives to improve response capability. Details of oil-spill contingency plans are to be provided and consistent with national and regional management. Where hydrogen sulphide (H₂S) is present, a separate contingency plan is to be provided.

6.4 Security

Security management plans including any cyber security vulnerabilities and strategies.

6.5 Environment

Explanatory Notes:

Requirements and timing for Environmental Impact Assessment (EIA), also referred to as Environmental and Social Impact Assessment (ESIA), will depend on the country's legal framework. EIAs can take several months for the operator to prepare and similarly, given their complexity, can also take several months for the Government to review and approve. In some countries, an EIA is part of the FDP submission, in others it is required before the FDP is submitted. It is therefore critical that both the operator and relevant Government agencies incorporate sufficient time for preparation and review of the EIA as it is a criterion for FDP approval.

Environmental impacts and measures to minimise, manage and mitigate them, should be discussed both in qualitative and quantitative terms for all phases of the project, consistent with the Environmental Impact Assessment (EIA) which should be attached separately. Provide a summary of the findings from the EIA, including:

- Describe environmental factors relating to the facility emissions, storage, and discharges
- Overview of environmental management plan covering water and sewer-treatment systems, effluent-handling system (catchment, containment, treatment and discharge) of the storage facilities for chemicals and fuel.

6.6 Greenhouse gas (GHG) emissions and climate uncertainties

Explanatory Notes:

Countries have made international commitments under the Paris Agreement via Nationally Determined Contributions (NDCs). NDCs will be updated every 5 years with the expectation of more ambitious commitments in subsequent years - a ratchet mechanism. The petroleum sector is one of the largest sources of GHGs and it is therefore critical that FDPs should be consistent with national plans and strategies for low-carbon development and transition of the energy sector. Collecting projects' GHG data will help inform and shape national policies e.g. appropriately reflecting future NDC commitments. Please note that the ministries/agencies responsible for national accounting and reporting of GHG and development of NDCs should be consulted to ensure a coherent approach to the development of national GHG inventories.

Adopting a Net Zero approach as a criterion for FDP approval could support adaptation and mitigation efforts in country. Countries facing challenges in climate financing should explore the potential of requiring emissions to be offset through national climate mitigation projects e.g. mangrove restoration or decentralized rural electrification from renewable energy sources. This would be consistent with several companies' stated targets, could provide a source of climate financing and would also create ripple effects on employment and economic benefits.

In addition, the project's GHG profile is important to understand the implications of developments in the carbon space e.g. carbon pricing, carbon border-tax adjustments, emissions trading and offsetting mechanisms. This includes the risk to government revenues from the project which tend to be back-end loaded and hence will be disproportionately impacted by carbon risks including stranded assets, loss of markets, curtailed production, extreme weather events.

Overall, given the growing carbon risks, the value to the country may be significantly lower than expected. Operators should thus demonstrate how the project design minimises GHG emissions and is robust to growing impacts from climate change.

This section should provide an overview of the measures to quantify, monitor and minimise GHG emissions over the project's lifecycle and how resilient the project is to climate uncertainties.

- 1) Discuss any vulnerabilities to potential climate change impacts and how they have been factored into the design and operations of the project e.g. placement

and design of facilities/infrastructure, water usage minimised (droughts, limit use of freshwater draws, recycling), climatic events included in HSE systems (e.g. hurricanes, floods).

2) GHG strategy and management plan

- Estimated life-cycle GHG emissions for the project in accordance with the GHG Protocol. At a minimum, scope 1 and 2 are to be provided (direct and indirect emissions). Depending on the nature of the FDP, scope 3 emissions may also be required. *[Provide guidance on the methodology for reporting which should be aligned with national accounting and reporting requirements.]*
- Overview of project design and processes for minimising, measuring, monitoring and reporting GHG emissions and, in particular, provide an account for:
 - Ensuring zero routine flaring and venting. Also include specifics on equipment for measuring emissions from flaring and venting.
 - Measures to ensure energy efficient operations e.g. energy-efficient equipment, electric vs diesel engines, transportation
 - Leak detection and repair (LDAR) program for methane and other fugitive emissions including use of AI/technology remote surveillance
 - Use of renewable energy in operations
 - Potential for CCUS and/or hydrogen
- Outline phased plan for becoming Net Zero on scope 1 and 2 emissions with particular emphasis on offsets that can be delivered by potential in-country projects.

3) Sensitivity analysis of project economics to carbon price/tariffs. Evaluate project value and government revenue flows under various carbon pricing scenarios.

7. Decommissioning

Explanatory Notes:

Decommissioning is the inevitable end of all oil and gas projects and Governments run the risk of being left with the financial, environment and social costs of decommissioning activities if appropriate plans are not put in place. Regulators should thus ensure that decommissioning is adequately addressed from the start of a development. In instances where the legal requirements are silent or weak, it is better for the Operator and Government to resolve treatment. It is critical to ensure that the project is

designed with “the end in mind” and there is adequate financial assurance that decommissioning costs will be fully met by the owners.

A preliminary Decommissioning Plan should be submitted as part of the FDP. Naturally this would be a high-level initial view which will be refined over the project lifecycle.

An overview of the decommissioning plan for the development including assumptions for plugging and abandonment of wells, all associated infrastructure and measures that would have to be taken to leave the site in an environmentally sound state and for alternative uses (e.g. offshore: fishing, navigation, onshore: agriculture, local community use). Description should include at a minimum;

1. Provisions and steps included in the design and operations to facilitate decommissioning should be identified. e.g. drilling mud, drill cuttings treatment, re-use or Disposal of Facilities. Discuss any options identified for potential re-utilization of the facility and disposal solutions which may have an impact on the selection of materials and technical solutions.
2. Estimated year of cessation of production and timing of decommissioning activities. Please note all decommissioning activities are to be completed within the tenure of the governing petroleum agreement or licence.
3. A brief description of the decommissioning strategy/activities. i.e. how each component of the project will be dealt with (pipelines, tubing etc.)

Please note: The operator should assume plugging and abandonment of wells upon cessation of production and the complete removal of all infrastructure. This is consistent with international obligations, primarily under the United Nations Convention on the Law of the Sea (UNCLOS) and the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) and associated Protocol. Recognising there may be project variables and/or site-specific environmental and safety risks that may affect the timing and removal of installations, the Operator may propose alternative treatment. Such proposals would have to demonstrate that the alternative decommissioning approach delivers equal or better environmental, safety and well integrity outcomes compared to complete removal, a plan for collecting project specific information over its life-cycle to support the proposal and that the approach complies with all national laws and international commitments.

4. Preliminary decommissioning costs and basis for estimates
5. Financial assurance mechanism to ensure that decommissioning liability will be fully funded.

8. Social and Economic Impacts

Explanatory Notes:

Any approved FDP should demonstrate that there are economic benefits that will accrue to the country and the social implications are effectively being addressed. The Operator's submission should clearly explain how the project is expected to contribute to the local communities and the economy as well as the associated risks. The Government should seek to clearly establish key targets for the development where appropriate which would subsequently be managed over the life of the asset as part of the ongoing regulatory oversight.

It is important that the various government agencies are involved in tailoring this section to the national context. This will help ensure consistency, streamlining of information to be provided (benefit of reducing the administrative burden to the Operator and ensuring different Government agencies will receive all relevant information in a timely manner).

This section is to explain how the project will contribute to the sustainable development of the country by providing and overview of the social and economic impacts and the risks thereto. At a minimum it should contain an overview of Local Content, Social Impacts and Project Economics which are described later in this report. The Operator should provide additional information on other matters depending on the complexity of the development upon consultation with the Regulator.

8.1 Local content

Explanatory Notes:

In many countries, there are specific Local Content (LC) provisions contained either in law or in the governing Petroleum Agreement. The FDP is a key regulatory tool for Governments to enforce compliance with these requirements.

In tailoring this section to the national regulatory framework, care should be taken to ensure that the commitments made in the FDP can be tracked and monitored on an annual basis. The Government should develop standard reporting LC templates and clear guidance on definitions which can subsequently be used to monitor and evaluate progress against the Local Content Plan for the development.

Illustrative text is used below for the key LC areas – i.e. employment, procurement of goods and services and transfer of knowledge and technology – which should be replaced with country specific content to align with regulatory requirements.

An overview of the operator’s local content strategy over the full life cycle of the project as it relates to...

- Maximising employment and development of [insert nationality] including targeted metrics for measuring progress;
 - The expected size and composition of the workforce by discipline and location
- Maximising the participation of local suppliers along the value chain.
 - the procurement and contracting strategy [including tender evaluation methodology and vendor selection]
 - Targeted metrics for measuring progress.
- Encouraging the transfer of technology, knowledge and skills including research and development programmes
- Demonstrate how similar measures and performance metrics will be instituted for subcontractors

8.2 Social impacts

Explanatory Notes:

Social Impact Assessment (SIAs) are often embedded into Environmental Impact assessment (EIA) requirements. In some jurisdictions, the term ESIA are used to reflect the dual nature of the assessments. Regardless of the nomenclature, SIAs should be conducted for a development to ensure that the implications from the development are understood and effectively managed. This is of growing importance as without the “Social License to Operate” a number of projects have been stopped or delayed. The Government should provide clear guidance on SIA requirements to operators.

A separate Social Impact Assessment (SIA) should be included as an attachment to the submission. This section should provide a brief summary of the SIA including:

- How the SIA was conducted
- The stakeholder groups that will be impacted by the project and a stakeholder engagement plan including how consultations will be conducted
- The duration and extent of positive and negative social impacts. For example, displacement of communities, influx of migrants, people’s way of life and culture.
- Strategies and actions for preventing, or managing those impacts, as well as how the progress will be monitored. A Resettlement Action Plan is to be included, where relevant.
- Analysis and strategies for managing the impacts on women, vulnerable groups and Indigenous Peoples

8.3 Project economics

Explanatory Notes:

Given the high degree of uncertainty that can impact project economics, it is critical that the government has a clear appreciation of how government revenues will be impacted by changes in key areas of uncertainty e.g. pricing, production, costs. Ideally the government should have independent economic models and experts to conduct independent evaluation of the feasibility of a project and the returns to the country. The government should establish what key metrics should be provided and the discount rate to enable comparisons across various projects in the country.

Please note that economic analysis is to be provided in the other sections to underpin decisions made in areas such as area development strategy and preferred concept selection. All economic analysis is to be performed on a consistent basis in order to ascertain pre-tax project viability as well as the potential returns to the investors and the state. At a minimum the following metrics should be provided: Net Present Value, Internal Rate of Return (IRR), discounted payback period, break-even price, government take (ratio of government NPV from total pre-tax NPV). Government indicators should be provided at a granular level for understanding of the value derived from various elements e.g. royalty, taxes, state participation.

This section is to provide an understanding of the economic viability of the proposed project, how robust it is to changes in key project parameters and how benefits will be shared between the government and the companies under a range of potential outcomes. All relevant aspects of the project and quantification of key uncertainties should be included. The following particulars must be provided:

- 1) Basis and methodology for economic analysis. Project economics for the proposed development are to be presented on pre-tax and post-tax basis using a [10]% discount rate and for three scenarios (base, low and high). The base case should be on P50 estimates of resources, costs etc. [Please note different companies will use different discount rates and this can significantly impact project economics and hence the assessment of value to the company as well as the government. The use of a standard discount rate will enable comparison across multiple projects and companies. It does not mean that a company's investment decisions will be based on this specified rate. The standardised discount rate for FDP economics should be established in consultation with Ministry of Finance.].
- 2) Any factors which are critical to commercial viability and how they will be managed. For example:

- Marketing and sales arrangements for products (crude oil, gas, condensate, NGLs etc.). Provide evidence of efforts made to obtain contracts for the sale of products, including any information on approaches by third parties, engagements with potential buyers.
 - Project financing. Details on the source of funding over development and production including debt-to-equity ratio and , borrowing costs.
 - An account should be provided of future commercial opportunities that may provide a basis for changes in the investment scope.
- 3) Economic analysis assumptions made in generating the project's net cash flows:
- Annual production profile by hydrocarbon type and sales volumes by product (e.g. oil, gas, condensate, NGLs)
 - Annual and total cost estimates – capital expenditure (capex), operating expenditure (opex) and decommissioning costs accompanied by a description of the methodology, assumptions, and basis for the cost estimates. Benchmarking of costs to similar projects should be provided. Each cost profile should be provided at a granular level for each major component. *[It is recommended that the regulator should request information in a form that is consistent with fiscal regime and contract/licence management e.g. Annual work plan and budget format (it should be noted that the level of detail at FDP if submitted at select stage will not be as granular as annual budgeting or taxation purposes. However, the categories should be provided for ease of monitoring and understanding performance.)]*
 - Pricing and sales assumptions. Gas contracts should be documented and should include base price, escalation factors, lag period, base values for escalation factors and the contract duration.
 - Information on tariffs and tariffing arrangements including total annual fixed and variable costs (for use of facilities or pipelines etc.) and basis for tariff calculations (e.g. base cost per barrel, escalation factors and escalation lags).
 - All other assumptions such as exchange rates, inflation, project financing.
- [Please note: It is recommended that standard templates are used for the operator to submit the underlying assumptions where appropriate e.g. production, costs, sales.]*
- 4) Base Case Project economics and sensitivity analysis. The base case is expected to be based on P50 estimates of resources, costs etc. Key project uncertainties such as sales prices, carbon pricing, costs, resource base and schedule delays are to be quantified and economic outcomes provided. Provide summary metrics in tabular format and in tornado charts.

- 5) Scenario analysis. A minimum of two cases are expected for the preferred development solution and are to be consistent with P10 and P90 estimates for production, costs as outlined within the FDP submission. Depending on the particulars of the FDP, additional scenarios may be required.

9. Project Schedule, Planning and Execution

Provide an overview of the project schedule, critical-path activities and measures that will be employed to effectively manage risks and ensure delivery of the project on time and within budget. This section should:

- Provide a description of the project management system
- Describe how the competence and compliance of all personnel involved, including contractors, will be assessed and monitored
- Outline the procurement and contracting strategy with a focus on long-lead items
- Include a list and of all necessary permits required and evidence of compliance where applicable
- Provide an integrated project schedule to production including key events and critical milestones (e.g. consultations from the stakeholder engagement plan), and cost estimates

10. Risk Management

Provide an overview of the project's key uncertainties (upsides and downsides) and strategies for managing. An overall project risk register detailing key risks and opportunities along with risk management and mitigation plans should be kept.

- Outline knowledge transfer and learnings. Lessons learnt at company and industry level should be presented, including how performance will be monitored and lessons captured across project implementation.
- Include a separate detailed project execution plan (PEP)
- Include a separate commissioning plan (to be submitted as the project develops)

Section 3: Contents for Revision of an Approved FDP

Explanatory Notes:

It is possible that the operator may seek approval to amend the approved FDP in light of new information or material changes in one of the many sources of uncertainty that can effect petroleum projects. To facilitate efficient processing of such requests, it is important for the government to provide clarity to the operator on the information that will be required to assess the acceptability of those changes.

The government does not anticipate that FDP revisions will be required routinely, and operators are encouraged to consult with the regulator as early as possible prior to preparing a revised FDP.

The government recognises that each project is different and depending on its nature and complexity, some subsections may not be applicable or, conversely, more information may be required. The operator should consult with the regulator on the specifics of a submission to ensure all documentation is provided in a timely manner.

- Executive summary: project performance to date, reasons for requesting revision to the FDP, proposed changes and implications. A comparison of economic metrics, with and without the changes, are to be presented. Details on government revenues by each source are also to be presented.
- Review of performance of the project relative to the FDP submission on the key section headings i.e. Field Description, Development Plan, Operations and Maintenance, HSE, Decommissioning, Social and Economic Impacts, Project Schedule, Planning and Execution.
- Details of the proposed changes. Results of studies or assessments should be attached with the submission.
- Implications on the FDP by relevant section headings i.e. Field Description, Development Plan, Operations and Maintenance, HSE, Decommissioning, Social and Economic Impacts, Project Schedule, Planning and Execution.

A material change includes, but is not limited to:

- Change to the development strategy or management strategy of a field or pool
- Changes to the plan for development of additional pools in the field
- Cessation of production, permanently or for the long term, before the date proposed in the FDP
- Introduction of new methods for petroleum recovery, such as enhanced recovery and injection of fluids

Appendix B

Checklist for the Efficient and Effective
Approval and Regulation of Field
Development Plans (FDPs)



The Commonwealth

Appendix B

Checklist for the Efficient and Effective Approval and Regulation of Field Development Plans (FDPs)

This checklist is a summary of the recommendations in [Chapter 3](#) of the Commonwealth Secretariat's publication *Field Development Plans: A Handbook for Government Officials*.

1. **Treat the FDP as an ongoing process that begins from discovery.**
 - Is there early and ongoing engagement with the operator prior to official FDP submission?
 - Is there a schedule of reviews starting in the Appraise phase?
 - Do all relevant government agencies involved in reviewing the FDP have a clear understanding of the project timeline and critical milestones? E.g. when key studies/evaluations are to be completed and when the FDP will be submitted?
2. **Promote a collaborative approach – with the operator and industry.**
 - Is there shared understanding of government strategy policy for the sector to guide industry efforts?
 - Is there a positive constructive environment between the government and company?
 - Is there a common understanding of the project's risks, opportunities and expected outcomes under various scenarios between the government and the operator?
 - Is there effective information sharing and communication by both the company and the government?
 - Are there mechanisms for industry collaboration, sharing of knowledge etc? i.e. amongst various companies, including suppliers and service providers?
3. **Ensure a robust regulatory framework.**
 - Has an assessment of the regulatory framework for FDPs been conducted to identify any areas which require strengthening? Please refer to FDP Legal Framework Checklist

- Are there clear guidelines to operators on the contents and form of the FDP submission? Please refer to [Appendix A](#) and [Appendix D](#).

4. Focus on optimising value to the country

- Is there a shared understanding between the operator and government on how the project can be leveraged to support broader national development goals?
- Is there an assessment of how the project can be leveraged to support industry development? e.g. optimization of infrastructure, shared costs.
- Is there a requirement for action plans in the Environmental and Social impact assessments to manage the risks?
- Is one of the criteria for FDP approval, demonstration of economic benefits to the State? i.e. government revenues versus a focus solely on the investor's returns
- Is there an independent evaluation of economic benefits from the FDP?
- Is there an economic model and expertise to support FDP analysis?
- Is there an understanding of how the relevant government's revenue streams could be impacted under different scenarios? e.g. pricing, production, costs, carbon pricing/tariffs
- Is there an understanding of the risks to the project value from the energy transition? e.g. economic analysis on carbon pricing/tariffs? Assessment on potential loss of markets?

5. Is there a strategic approach to capacity building and the use of external advisers?

- Is there an understanding of the type and timing of skills/expertise and tools required to effectively engage with the operator in the development of the specific FDP? Or more broadly across multiple FDPs?
- Has a skills-gap analysis been performed to identify and fill gaps in priority areas?
- Is there a strategy and resourcing plan which balances short-term needs with sustainable development of national expertise?
- Have mature hires (seasoned professionals with transferable skills) from other sectors been explored? E.g. mining or construction sectors, accountants from financial services etc.
- Targeted training of such individuals can be an effective way to accelerate the building of national expertise
- When experts are hired, do the contractual terms include specific actions and timeframes for knowledge transfer? E.g. documentation, mentoring/coaching

6. Ensure there is an internal government process for approving FDPs

- Are processes in place to avoid duplication of efforts in reviewing the FDP across various government ministries, agencies etc.?
- Is there an internal government process for approving FDPs? Please see [Appendix E](#) for detailed checklist

7. Recognise importance of managing stakeholder expectations, need for transparency and communication

- Is there a requirement for stakeholder analysis and engagement plan?
- Are there mechanisms for effective consultation with stakeholders? And for the provision of information to communities and the public on projects in a timely and effective manner?

8. Strategy to fund and develop government agencies especially pre-production

- Do the existing governing legal instruments (law, regulation, petroleum contract, licence) have provisions for funding third-party reviews and capacity-building efforts? Is the tax treatment of such costs clear?
- Are there training and development contributions/funds which can be utilised?
- Are there development agencies or other institutions which can support capacity building efforts?

9. Adopt a risk-and-resilience approach to reviewing, approving and managing the FDP

- Is there a clear understanding of the risks and uncertainties? And the impact on project economics and government revenues if they materialise?
- How are they being managed? Is there a robust risk management process in place?

10. Realisation of value to country requires flexibility and vigilance.

- Is there ongoing monitoring to ensure all activities are in accordance with an approved FDP? E.g. construction of facilities, drilling programme
- Is there a central data storage and management system for the project? E.g. FDP documentation, reports, updates provided by operator
- Is there ongoing engagement with the operator to ensure material changes in the FDP can be dealt with appropriately?
- Are there communication channels to all relevant arms of government if there are material changes to the FDP? E.g. Ministry of finance for changes in forecasted government revenues.

Appendix C

FDP Legal Framework Checklist



Appendix C

FDP Legal Framework Checklist

The checklist below is intended to be used as a guide for testing the robustness of the existing requirements related to FDP.

This checklist covers the key procedural matters as outlined in [Section 4.2](#) of the Commonwealth Secretariat's publication *Field Development Plans: A Handbook for Government Officials*.

Notification of Discovery	Yes/No	Instrument
Is there a stipulated time period for informing the regulator of the discovery?		
Is there a requirement to furnish the Regulator with copies of data, analysis and a technical assessment of the discovery?		
Is the timeframe for such reporting to the Regulator clearly specified?		
Is there an obligation for the operator to furnish additional information related to the discovery as requested by the Government?		
Is there a specified timeframe for the operator to notify the Regulator whether the discovery is of potential commercial interest and hence requires appraisal?		
If the operator notifies the regulator that it will not appraise the discovery, is there a clear linkage with relinquishment requirements?		
Appraisal		
Is there a specified time period within which the appraisal activities need to be completed? i.e. Is the duration of the Appraisal period clear?		
Is the process for extensions to the Appraisal period clear and transparent? Are the criteria, duration and conditions for extensions clearly established?		
Is there an obligation that an Operator shall not commence appraisal activities without an approved Appraisal Programme?		
Is there a requirement for the Operator to submit a proposed Appraisal Programme to the Regulator for approval within a specified timeframe? Is it clear what the consequences are if the Operator fails to submit in accordance with stipulated timeframe?		

Are the contents of an Appraisal programme clearly specified?		
Is there an obligation that the operator shall not vary an approved Appraisal programme without prior written approval from the Regulator ?		
Is there a requirement to furnish the Regulator with copies of samples, data and analysis?		
Is there a requirement to provide the Regulator an Appraisal Report, setting forth all relevant technical and economic information in evaluating whether the discovery can be technically and commercially viable?		
Is there a specified timeframe for notifying the Regulator whether the discovery is a commercial discovery? To be referred to as Declaration of Commercial Discovery.		
If the operator notifies the regulator that the discovery is not a commercial discovery, is there a clear linkage with relinquishment requirements?		
Is there an obligation for the operator to furnish additional information as requested?		
Field Development Plan (FDP)		
Is there an obligation that petroleum operations must be performed in accordance with an approved FDP?		
Is there a specified timeframe after Declaration of Commercial Discovery that an FDP must be submitted to the Regulator? Is it clear what the FDP submission timeframes and treatment is for Natural Gas? Is it clear what the consequences are if timelines are not adhered to?		
Is there a mechanism for ongoing engagement between the Government and Operator during the development of the FDP? Does it enable Government to be fully informed during the development of the proposed FDP		
Are the contents of an FDP clearly specified?		
Does the approval process provide for the use of independent specialists to support government’s review of the proposed FDP? Is it clear how this will be funded? Is it clear how independent advisers are treated for cost recovery and tax purposes?		
Is there a clear transparent process for the approval of FDP?		
<ul style="list-style-type: none"> Are there conditions and criteria that must be met for approval? 		

<ul style="list-style-type: none"> Is there a specified timeframe for government to inform the operator on its decision? Does this timeframe enable Government to conduct independent review of the FDP? 		
<ul style="list-style-type: none"> Are there appropriate checks and balances on the decisions? For example, recommendations made by Regulator, approval by Minister. Or Cabinet or Parliament review? 		
Is there a process established to resolve disputes on the FDP if they arise?		
Ongoing FDP Monitoring and Compliance		
Are all future activities required to be consistent with the approved FDP? E.g. Are annual work programmes and budgets required to be in accordance with the FDP?		
Does any material deviation, or alteration to, an approved FDP require the Regulator's prior written approval?		
Is the Operator required to provide notification in writing of any material change or anticipated material change in an approved FDP?		
Is the form and contents of a request to vary or amend the FDP clearly specified?		
Is there a clear transparent process for the approval of FDP?		
<ul style="list-style-type: none"> Are there conditions and criteria that must be met for approval? 		
<ul style="list-style-type: none"> Is there a specified timeframe for government to inform the operator on its decision? Does this timeframe enable Government to conduct independent review of the FDP? 		
<ul style="list-style-type: none"> Are there appropriate checks and balances on the decisions? For example, recommendations made by Regulator, approval by Minister. Or Cabinet or Parliament review? 		
Does the approval process provide for the use of independent specialists to support government's review of the proposed variation? Is it clear how this will be funded? Is it clear how independent advisers are treated for cost recovery and tax purposes?		

Appendix D

FDP Model Provisions



The Commonwealth

Appendix D

FDP Model Provisions

Discovery and Development Model Provisions (Petroleum Act, Regulations and Petroleum Agreement)

The legal framework consists of the combination of the laws, regulations and contracts that govern operations and interactions in the petroleum sector. It is recommended practice that as far as practically possible, the requirements related to the FDP are enshrined in legislation (either the Petroleum Act or regulations) so that it is not a negotiable element of petroleum agreements thereby providing a robust regulatory framework to ensure the country's interests are protected.

The provisions cited below can be used as a guide for ensuring the key aspects related to FDPs as discussed in [Chapter 4](#) are adequately addressed in the legal framework.

Please note that terminology in countries' legal frameworks can differ as it reflects different systems for the award of petroleum rights (contracts, licenses or both), different institutional arrangements (e.g whether there is a National Oil Company or independent regulator) and different approving entities (regulator, minister). Within this document:

- 'Contract area' is used as the reference for the petroleum right
- 'Contractor' is used as the reference for the holder of petroleum rights (i.e. the company)
- the generic term 'regulator' is used to represent the government entity with responsibility for administering the petroleum sector. This could be the Ministry of Petroleum, Petroleum Commission, or the National Oil Company.

The following colour coding has been used to distinguish the types of provisions that are typically found in law (usually establishes requirements and principles), regulations (outlines specific details) and the petroleum agreement (generally refers to the legislation and operationalisation of requirements).

Blue: Provisions typically found in laws

Orange: Provisions typically covered in regulations

Green: Provisions typically covered in petroleum agreements

Black: Guidance notes which are intended to provide some context around the particular provision.

Notification of Discovery

1. (1) Where a discovery of petroleum is made in a contract area, the CONTRACTOR shall:
 - (a) immediately notify the REGULATOR of the discovery;
 - (b) within a period of seven, (7) days from the date of the discovery, furnish to the REGULATOR, in writing, the particulars of the discovery including if the discovery potentially extends beyond the boundaries of the contract area and any other particulars as the REGULATOR may require;
 - (c) promptly cause tests, and studies to be conducted to determine the commercial viability of such discovery; and
 - (d) notify the REGULATOR if it intends to conduct a drill-stem or production test at least twenty-four (24) hours prior to the proposed test, and the REGULATOR shall have the right to have a representative present during such test.
- (2) Not later than 270 days from the date of discovery, the contractor shall submit:
 - (a) copies of data from tests and studies conducted and its analysis and interpretation thereof,
 - (b) a report to the REGULATOR on the technical evaluation and assessment of the potential commercial viability of the discovery, and
 - (c) notification of whether or not, in the contractor's opinion, such discovery is a potential commercial discovery and requires appraisal.
- (3) Where a notice served under subsection 2(c) states that the discovery is not commercially viable, or if the CONTRACTOR fails to provide notification within two hundred and seventy (270) days from the date of discovery days, the REGULATOR may by notice in writing to the CONTRACTOR, require the CONTRACTOR to relinquish the area corresponding to such discovery and forfeit any rights relating to such discovery. Any such relinquishment before the end of the exploration period shall be carried out in accordance with {relinquishment section} of the Act.

An effective system for the award of petroleum rights will include clearly-defined relinquishment requirements such that at the end of the Exploration Period, all acreage where there are no discoveries will be returned to the State.

Appraisal

2. (1) Where the CONTRACTOR has notified the REGULATOR pursuant to Section 1(2) that a discovery requires appraisal, the CONTRACTOR shall within ninety (90) days of such notification, submit an appraisal programme to the REGULATOR for approval. The appraisal programme shall:
 - (a) identify the location of the appraisal area which shall not extend beyond the provision of a reasonable outer boundary of the discovery as determined after consultation with the REGULATOR;
 - (b) include a detailed work programme including but not limited to, seismic, drilling of wells, flow tests, assays and studies to be carried out, geological and reservoir engineering studies, laboratory work;
 - (c) associated budget for appraisal operations; and
 - (d) state the duration of the appraisal period, which shall not exceed two years unless otherwise agreed with the REGULATOR.
- (2) Approval of an appraisal programme shall not be unreasonably withheld, and the REGULATOR may stipulate conditions for approval.
- (3) The appraisal period shall commence on the date that the REGULATOR notifies the CONTRACTOR, in writing, of its approval and shall not exceed [two years]. *Appraisal period to be consistent with country's licensing regime.*
- (4) The CONTRACTOR shall not:
 - (a) commence appraisal operations until the appraisal programme is approved by the REGULATOR; or
 - (b) amend an appraisal programme without the prior written approval of the REGULATOR.
- (5) Not later than ninety (90) days from the date on which an appraisal programme is completed, the CONTRACTOR shall notify the REGULATOR in writing as to whether the discovery is a commercial discovery and deliver to the REGULATOR a full report of the appraisal programme setting forth all relevant technical and economic information, including, but not limited to, the following particulars:
 - (a) the characteristics, quantity and quality of the petroleum discovered including the chemical composition, physical properties, and estimates of crude oil and natural gas resources and recoverable reserves;
 - (b) the stratigraphical position and depth of the discovery;

- (c) the petrophysical properties of the petroleum reservoir formation;
- (d) the reservoir's productivity indices for the wells tested at various rates of flow;
- (e) the permeability and porosity of the reservoir formations;
- (f) an estimate of the production capacity of the petroleum reservoir;
- (g) an evaluation of the petroleum reservoir and adjoining areas;
- (h) an assessment of potential effects of the petroleum operations on the environment, social and other applicable areas;
- (i) any additional geological, geophysical and geochemical data and other relevant information relating to the petroleum reservoir;
- (j) economic analysis underpinning the determination of commerciality and supporting assumptions; and
- (k) any data or other information as requested by the REGULATOR.

The date of such notification shall be the date of the declaration of commercial discovery.

- (6) The Minister may in special cases, upon the recommendation of the REGULATOR, grant an extension of the appraisal period for a further period not exceeding two years and may stipulate conditions for the extension as prescribed.

Provided that the CONTRACTOR can establish, to the satisfaction of the REGULATOR, the existence of special circumstances that justify the extension of the appraisal period.

- (7) Where a notice served under subsection (5) states that the discovery is not of commercial interest, or if the CONTRACTOR fails to provide notification within ninety (90) days of completing the appraisal programme, the REGULATOR may by notice in writing to the contractor, require the CONTRACTOR to relinquish the area corresponding to such discovery and forfeit any rights relating to such discovery. Any such relinquishment before the end of the exploration period shall be carried out in accordance with *{relinquishment section}* of this Act.
- (8) The REGULATOR may at any time by notice in writing, require the CONTRACTOR to furnish the REGULATOR, within such period as may be specified in such notice, with such particulars on any matter so specified concerning a discovery or any appraisal of a discovery.

Field Development Plan

The approval of a Field Development Plan is a critical part of regulating the sector. The government should be fully informed of all matters related to the development of its resources (e.g. technical, financial/economic, health, safety, security, environmental and social) and the risks associated with the project to enable sound decision making. All future petroleum activities within the contract area should be consistent with the approved FDP and, as such, is one of the most important approval points for governments.

- (1) If a discovery is commercially viable, the CONTRACTOR shall submit a field development plan for approval to the Minister within one hundred and eighty (180) days of such notification, or as otherwise agreed, in the manner prescribed in regulations.
- (2) A field development plan shall contain at a minimum:
 - (a) a description and map of the area containing such discovery which the CONTRACTOR proposes to delineate as a field defined by reference to the UTM grid;
 - (b) a detailed report accompanied by supporting data and all analyses and interpretations thereof, which demonstrates that the area described in paragraph (a) above contains, alone or in conjunction with other areas, as the case may be, a commercial discovery;
 - (c) a comprehensive field description including a map history, the boundaries of the field, reservoir details, estimates of hydrocarbons in place, recoverable reserves and the maximum efficient rate of production;
 - (d) alternative concepts considered for the development of the field and details on the preferred development option including facilities and infrastructure, drilling programme, delivery points, export route, production profiles and any by-products recovered in processing such petroleum including the method for the use or disposal of associated gas;
 - (e) the applicant's proposals relating to the spacing, drilling and completion of wells and, the facilities required for the production of petroleum, including:
 - (i) the estimated number, size and production capacity of production platforms, if any;
 - (ii) the estimated number of production wells;
 - (iii) the particulars of production equipment and facilities, including piping and instrumentation drawings/engineering plans;

- (iv) the particulars of feasible alternatives for transportation of petroleum, including pipelines;
 - (v) the particulars of installations required, including the type and specifications or size of those installations; and
 - (vi) the particulars of other technical equipment required for the operations;
- (f) reservoir engineering methodology;
 - (g) a description of technical solutions, including possible solutions for enhanced recovery;
 - (h) where the development is planned in two or more phases, the CONTRACTOR shall provide information on the full development to the extent possible and measures to maximise recovery of petroleum;
 - (i) the estimated production profiles for crude oil and natural gas from the petroleum reservoirs;
 - (j) the cost estimates of capital and operating expenditures of the project;
 - (k) the manner in which the development and production of the field is to be financed;
 - (l) a project schedule including estimated date for the commencement of production;
 - (m) an assessment of whether the development of and production from the field should be subject to unitisation in accordance with the provisions of this Act;
 - (n) the arrangements made for the sale of petroleum and its by-products including transportation agreements;
 - (o) an economic analysis to determine the commercial viability of the development and the underlying production profiles, capital costs, operating costs and pricing assumptions used;
 - (p) the manner in which it is intended to prevent pollution, to deal with waste, to safeguard the natural resources and to minimise the effect of such operations in the contract area and on areas adjoining the contract area;
 - (q) a health and safety plan including the safety measures to be adopted in the course of the development and production of petroleum and measures to deal with emergencies;

- (r) solutions for the efficient use of energy and the necessary measures to be taken for the protection of the environment including the prevention and minimisation of environmentally harmful discharges and emissions;
 - (s) a local content plan;
 - (t) a preliminary decommissioning plan;
 - (u) an assessment of how to coordinate petroleum operations with other holders of a petroleum contract, including the joint use of facilities subject to the Act and any other applicable law and regulations;
 - (v) an assessment of the potential for development of further petroleum resources within the exploration area to ensure the maximum long-term recovery of petroleum resources;
 - (w) management systems, including information on the planning, organization and implementation of the development;
 - (x) measurement and allocation equipment, systems and procedures including a description of fiscal metering systems and identification of delivery point(s);
 - (y) a petroleum marketing plan and where appropriate a gas infrastructure and marketing plan;
 - (z) a security plan; and
 - (aa) any additional information as requested by the REGULATOR.
- (3) The REGULATOR shall evaluate the field development plan submitted under subsection (1) and make recommendations to the Minister regarding the approval of the field development plan. The Minister shall provide the CONTRACTOR with his or her decision in writing within a reasonable time of receipt of all required data and information.
- (4) A field development plan shall become effective upon the written approval of the Minister.
- (5) Where a field development plan is not approved, the Minister shall by notice in writing state the grounds for its decision and the CONTRACTOR may modify and re-submit a field development plan within a timeframe stipulated by the Minister.
- (6) The Minister shall not approve a field development plan unless:
- (a) the plan shall ensure efficient, beneficial, and timely exploitation of the petroleum resources concerned;
 - (b) the plan takes into account best industry practice;

- (c) the CONTRACTOR has the technical and financial competence and experience to undertake safe and effective production operations;
- (d) the CONTRACTOR is able and willing to comply with the conditions on which a field development plan is approved;
- (e) there are demonstrable financial benefits to [COUNTRY] from the development of the petroleum resources; and
- (f) the REGULATOR has recommended approval.

Provisions usually found in Regulations

These are often procedural in nature. Please note that timings are only indicative and should be tailored to a country's particular circumstances.

- (1) Pursuant to the Act, a CONTRACTOR shall within one hundred and eighty (180) days of notification of a commercial discovery, submit a Field Development Plan to the REGULATOR which shall provide detailed information on the reserves, technical, operational, facilities, safety, commercial, local content and environmental components of the proposed development.
- (2) The Minister may in special cases, grant an extension for the submission of a Field Development Plan pursuant to sub-regulation (1) upon the recommendation of the REGULATOR.

Provided that the CONTRACTOR can establish, to the satisfaction of the REGULATOR, the existence of special circumstances that justify such an extension.

- (3) The REGULATOR shall, within two hundred and seventy (270) days of receiving a Field Development Plan in accordance with sub-regulation (1), make a recommendation to the Minister on whether to:
 - (a) approve the plan; or
 - (b) reject the plan; or
 - (c) approve the plan subject to specified conditions; or
 - (d) notify the applicant in writing that the REGULATOR is unable to make a decision without further assessment of the plan. Such notification shall include any further information that is required to make a decision and an estimated date by which a decision will be provided.
- (4) The REGULATOR shall, within fifteen (15) days of receiving a Field Development Plan from the CONTRACTOR under sub-regulation (1), notify the CONTRACTOR in writing if it intends to use independent specialist(s) to support its review of the Field Development Plan. The specialist(s) shall be selected on a competitive basis and the costs shall be borne by the CONTRACTOR and shall be an allowable expense for tax purposes.

- (5) The Minister shall as soon as practicable, but no later than thirty (30) days from receiving the REGULATOR's recommendation under sub-regulation (3), notify in writing the CONTRACTOR if the field development plan is:
- (a) approved as submitted
 - (b) conditionally approved with such terms and conditions provided.
 - (c) rejected and the grounds for the decision. The CONTRACTOR shall promptly revise the field development plan and re-submit to the Regulator.
- (6) The REGULATOR shall recommend the approval of a Field Development Plan only where the plan:
- (a) satisfactorily meets the requirements pursuant to section 2 of the Act;
 - (b) meets the technical standards that are required for the related works;
 - (c) demonstrates that there will be financial benefits to {insert country};
 - (d) demonstrates that the operations will be conducted in a manner that is:
 - (i) consistent with best international petroleum industry practice; and
 - (ii) compatible with optimum long-term recovery of the petroleum.

Provisions in Petroleum Agreements

Effective petroleum agreements, irrespective of whether they are PSCs or Tax and Royalty Concessions, will contain an article establishing a mechanism for ongoing meetings between the owners and the government, usually quarterly. This is often referred to as the Joint Management Committee (JMC), or Management Committee or Technical Management Committee. The JMC is often established no later than thirty (30) days from the Effective Date of the petroleum agreement. Membership is composed of representatives from the government and the owners. As part of its functions, the JMC should have oversight and ongoing review of petroleum operations and should have "technical meetings". In so far as practical, the technical meetings should be leveraged to provide timely updates and information related to the development of the FDP. At critical milestones during the operator's project management process for the project (Appraise/Select etc.), progress and decisions should be reviewed at the JMC and/or Technical Sub-Committees.

- (1) If the CONTRACTOR notifies the REGULATOR that the Discovery is commercial, the CONTRACTOR shall
- (a) agree a schedule of reviews with the REGULATOR during the preparation of the Field Development Plan to ensure that the REGULATOR is informed of key milestones and decisions including, but not limited to, concept selection;

- (b) promptly prepare a Field Development Plan for review and endorsement by the JOINT MANAGEMENT COMMITTEE, and
 - (c) submit such endorsed Field Development Plan to the REGULATOR for approval by the Minister within one hundred and eighty (180) days of notification of Commercial Discovery, in accordance with the Act.
- (2) The REGULATOR shall, within fifteen (15) days of receiving a Field Development Plan from the Contractor, notify the CONTRACTOR if it intends to contract independent expert(s) to review the Field Development Plan. The expert(s):
 - (a) shall be selected through an international tender. A minimum of three (3) firms, agreed by the REGULATOR and CONTRACTOR, shall be invited to participate in the tender. The REGULATOR and the CONTRACTOR shall run the tender process and select the winning tender;
 - (b) shall within ninety (90) days of award of contract, submit an evaluation report of the FDP and its recommendations to the REGULATOR and the Contractor. The CONTRACTOR shall submit in a timely manner any information required by the expert to prepare such report.
 - (c) costs shall be borne by the CONTRACTOR and shall be an allowable expense for tax purposes.
- (3) If the CONTRACTOR and REGULATOR mutually agree, paragraph 2 may also apply, to key technical reports and studies delivered under paragraph 1(a) to enable efficient preparation of the Field Development Plan.
- (4) Pursuant to Regulation, the REGULATOR shall within two hundred and seventy (270) days of receiving a Field Development Plan, make a recommendation to the Minister of its approval or rejection and any conditions attached thereto.
- (5) Pursuant to Regulation, the Minister shall as soon as practicable, but no later than thirty [30] days from receiving the REGULATOR's recommendation under paragraph 4, notify in writing the CONTRACTOR whether the Field Development Production Plan is:
 - (a) approved as submitted. The CONTRACTOR shall, as soon as practicable, commence Development and Production Operations in accordance with the approved Field Development Plan and shall revise the approved Work Programme and Budget accordingly.
 - (b) conditionally approved with such terms and conditions provided.
 - (c) rejected and the grounds for the decision. The CONTRACTOR shall promptly revise the Field Development Plan and submit to the JMC for

review and endorsement, after which the revised Plan shall be submitted to the REGULATOR.

- (6) If the JMC are unable to agree upon a revised Field Development Plan at the meeting referred to in clause 5(c), any member may refer the matter for determination by a Sole Expert contemplated in clause XX.

The determination by a Sole Expert shall be final and the Field Development Plan shall be deemed to have been adopted and approved as determined, except that the CONTRACTOR may, within sixty (60) days of receipt of such determination, notify the REGULATOR that the Discovery is no longer considered to be commercial. If the CONTRACTOR so notifies the REGULATOR, the provisions of paragraph XX (related to non-commercial discoveries) shall apply. The CONTRACTOR shall, as soon as is practicable, commence Development and Production Operations in accordance with the approved Field Development Plan and shall revise the annual Work Programme and Budget accordingly.

- (7) Any deviation from, or alteration to, an approved Field Development Plan requires the prior written approval of the Minister. Approval shall be sought in accordance with the Act.

VARIATION TO AN APPROVED FDP

Provisions usually found in Petroleum Act

- (1) Any deviation from, or alteration to, an approved field development plan requires the prior written approval of the Minister.
- (2) The CONTRACTOR shall promptly notify the Minister in writing of any material change or anticipated material change in an approved field development plan.
- (3) The Minister may, upon recommendation by the REGULATOR, require a revised field development plan to be submitted if there is an anticipated material change to the approved field development plan.
- (4) The Minister may, upon the recommendation of the REGULATOR, approve a request to revise a field development plan, such approval not to be unreasonably withheld.

Provisions usually found in Regulations

- (1) an application for a revision to the approved Field Development Plan shall include:
 - (a) a full description of the change(s) for which a revision of the field development plan is being sought;

- (b) a detailed description of how the proposed changes are likely to effect the technical development of the field, production and recovery of reserves;
 - (c) detailed forecasts of the impact of the changes on the revenue to government compared to the existing development plan;
 - (d) how the changes will affect the financing and funding of the development of the field.
 - (e) an economic analysis of the impact of the change(s) compared to the existing development plan;
 - (f) any other impact the proposed variation of alteration will have and is likely to have on the development of the field including decommissioning funding; and
 - (g) any such other matters as may be reasonably required by the REGULATOR.
- (7) The REGULATOR shall evaluate the application for variation or alteration as soon as practicable and may request further information from the applicant to facilitate the adequate evaluation of the application.
- (8) At the end of the evaluation, the REGULATOR shall submit its recommendations to the Minister on whether or not the proposed variation or alteration should be approved and shall include, in its recommendations:
- (a) the reasons for the recommendation;
 - (b) the terms of the recommended decision;
 - (c) if it recommends acceptance of the variation subject to a condition, the condition and the reasons for making the acceptance subject to a condition.
- (9) The variation shall take effect on the date the Minister communicates his or her approval to the applicant unless it is otherwise stated in the decision and the plan as varied shall replace the existing plan from that date.

Appendix E

Developing an Internal Government FDP Process



The Commonwealth

Appendix E

Developing an Internal Government FDP Process

The checklist below is intended to be used as a guide for developing an internal government process for reviewing and approving FDPs.

It is a summary of the recommendations in [Chapter 5](#) of the Commonwealth Secretariat's publication *Field Development Plans: A Handbook for Government Officials*.

STEP 1: Establishing an Intra-Governmental Team (IGT).

The composition and empowerment of the IGT would be central to effective stewardship of the FDP process and would depend on the country's legal framework.

IGT Mandate

The IGT should be established with the ability to make decisions and recommendations on behalf of the respective agencies. Given the context, it is important for the IGT to have political support.

- Is there a clear mandate for the IGT?
- Would a Terms of Reference be useful?
- Is there clear understanding of the scope of the FDP review?

MEMBERSHIP OF IGT

- Is there a lead "Coordinating" institution for the FDP?
Entity Public Utilities, Local Planning, Development and Infrastructure, Social and Community Development, Labour
- Has a stakeholder mapping exercise been conducted to identify relevant ministries, agencies and inform membership of the IGT?
Relevant ministries/agencies may include Ministry of Finance, Energy, Environment, Public Utilities, Local Planning, Development and Infrastructure, Social and Community Development, Labour. Not every government agency, ministry or entity will need to participate directly in the FDP review process or be represented on the IGT but may be called up to provide guidance, information, verification and input when required.
- Is there an assessment of skills and expertise required? Including timing and duration
The IGT would need access to skills and expertise to review the components of the FDP. The government should consider whether it has the capacity to staff the IGT in each of the above listed areas using in-house resources or whether external advisers will be needed.
- If external experts are required, how will the contracting process be managed?
The structure of the IGT should be informed by the government's plans for building a cadre of national experts. Where external experts are hired, the contractual terms should include specific actions and timeframes for documentation, mentoring/coaching to facilitate knowledge transfer.
- Is there clarity on the roles and responsibilities for members of the IGT?
Consider use of RASCI matrix (Responsible, Accountable, Support, Consult, Inform) or similar tool to clarify the roles of each identified government entity or individual.

STEP 2: Establishing Intra-Governmental Team (IGT) Protocols

A holistic, proactive approach to the FDP requires government engagement from discovery. To ensure effective coordination and communication over an extended period of time it is important for the IGT to establish clear protocols for how they will interact with each other and the companies.

Establishing government objectives

- Is there a chairperson and focal point for the FDP process?
This should be a sufficiently experienced and senior member of the IGT.
- Is there clarity on government objectives?
Has each institution identified objectives and expectations for their relevant areas in the FDP? This would help to identify potential misalignments between ministries/agencies
- If there are misalignments, is there a process or mechanism to discuss trade-offs in order to establish a whole-of-government position?

Communication and meeting protocols

These should be aligned to operator-government scheduled reviews. Particular attention should be paid to ensure alignment with the operator's project management process, timelines and key milestones. It is natural that meetings will intensify at critical junctures of the project and when the FDP has been submitted.

- IGT Meeting frequency and objectives.
- IGT Members' communication with principals. Part of each IGT member's role must be to ensure that they disseminate information and provide project updates to the relevant Minister as well as counterparts who may not attend IGT meetings
- How information will be shared, especially with respect to the timing of reports and findings

Process for resolving issues and misalignments between operator and government

It is inevitable that there will be differences between the operator and government. A system should be put in place for these to be resolved in a timely fashion. For example, "critical" or "strategic" matters which will have significant bearing on project design versus areas for clarification.

- Is there an agreed approach to categorising matters?
- Is there a dashboard or tracking tool?

Decision making and escalation protocols

If agreement on critical issues cannot be resolved within the IGT, how will they be managed? This may not present in technical matters but may be of particular relevance on strategic issues:

STEP 3: Ongoing IGT engagement and communication during FDP

It is highly recommended that the government working collaboratively with the operator establishes a schedule of reviews as the FDP is being developed.

As far as possible, engagements on the FDP should be carried out via the existing technical review meetings between the regulator and the company. For example via the Joint Management Committee/Technical Coordination Committee under the Petroleum Agreement/Licence. It would be natural that as the project matures IGT engagement would increase.

STEP 4: Close out and lessons learnt

It is highly recommended that the government working collaboratively with the operator establishes a schedule of reviews as the FDP is being developed.

The IGT should undertake an evaluation of the process and outcomes to ascertain what worked well and where there were opportunities for improvement. This would help to create a basis for knowledge transfer as well as increasing system efficiency.



The Commonwealth

Developing a petroleum field requires the safe and efficient execution of extremely complex, technical, risky, multi-billion-dollar projects. The Field Development Plan (FDP) is the company's proposal for how it intends to develop a field and manage the associated risks. It is the outcome of a lengthy multi-disciplinary process and is submitted to the government for approval.

The FDP is a critical moment in the project lifecycle as decisions will impact the field over its entire life. It is therefore of paramount importance that the government is able to review these plans to ensure that strategic, technical, economic, social and environmental issues are effectively addressed.

This handbook has been developed to support government officials in the effective review, approval, and oversight of Field Development Plans.

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